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# RECEIVER ANALYSIS PROGRAM

PASSIVE ELECTRONIC COUNTERMEASURES BRANCH ELECTRONIC WARFARE DIVISION

DECEMBER 1976

TECHNICAL REPORT AFAL-TR-76-199 INTERIM REPORT FOR PERIOD OCTOBER 1974 to NOVEMBER 1975

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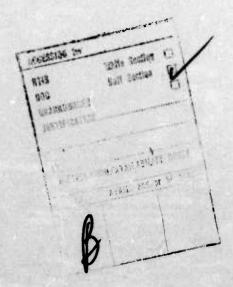
are put to the user during execution, which help to guide him in the use of the program. It can be used either through an intercom or batch terminal. The program uses the specifications of the receiver components as input, i.e., gain, noise figure, intermod point, etc. The output of the program will not only generate the important characteristics of the receiver, such as sensitivity, dynamic range, and spurious product, but also indicate the elements that limit the performance, by generating the percentage of contribution by each component. One can also easily add a new component to a receiver, eliminate an old one or change the specifications of a component. In case one intends to cover a wider instantaneous bandwidth, for example, in channelized receivers with less hardware, a fold mode can be used. This program can handle the noise figure of the fold mode, provided that the different front ends of the receiver have the same noise figure.

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#### FOREWORD

This report presents a computer program aid for use in the design and evaluation of electronic warfare receivers. It is a modification of the Receiver Signal Path Analysis Program (RSPAP), which was created by the McDonnell-Douglas Company. It is an interim report in the continuing effort to update design, performance, and analysis capabilities of the program.

This technical report was prepared by Dr. J. B. Y. Tsui and Mr. W. T. Brumfield of the Passive Electronic Countermeasures Branch, Electronic Warfare Division, The Air Force Avionics Laboratory, Wright-Patterson AFB, Ohio, under Project 7633, Task 1115. Ms. S. J. Johnson of the Digital Programming Branch, ASD Computer Center, wrote the computer program for the receiver modeling. The work period for this effort extended from October 1974 to November 1975.



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- INTRODUCTION: The objective of this effort was to develop a receiver modeling program to aid in the design of and evaluation of electronic warfare receivers. Specifically, this program was developed to evaluate the design of channelized and superheterodyne receivers and predict their performance characteristics based on signal path analysis and specifications of the functional components. This (computer) program is a modification of Receiver Signal Path Analysis Program (RSPAP), created by McDonnell-Douglas The program will compute the performance of a microwave receiver, given the proper input information. It will not only generate tabulated printouts of the important characteristics of the receiver, such as sensitivity, dynamic range, etc., but also indicate the elements that limit the performance. Elements can be changed, added, or eliminated easily in the design to generate a new set of performance parameters. It accepts inputs from either the intercom terminal or batch terminal (punched cards), and has the flexibility to accommodate a wide range of receiver design plans. Continued effort is being made to update this program to incorporate new receiver designs and improve its analysis ability.
- 2. INPUT INFORMATION PREPARATION
- 2.1 INTERCOM MODE: To run the receiver simulation in either the intercom or batch mode, the necessary inputs and corresponding or desired outputs must be specified. Input data preparation involves, first of all, development of a functional block diagram (see Figure 1) and assignment of a receiver identification number. The number assigned to a special receiver actually assigns a file to save the input data for future use. The receiver block diagram must be divided into consecutively numbered blocks, starting with number 1 for the first block at the receiver input. The number of

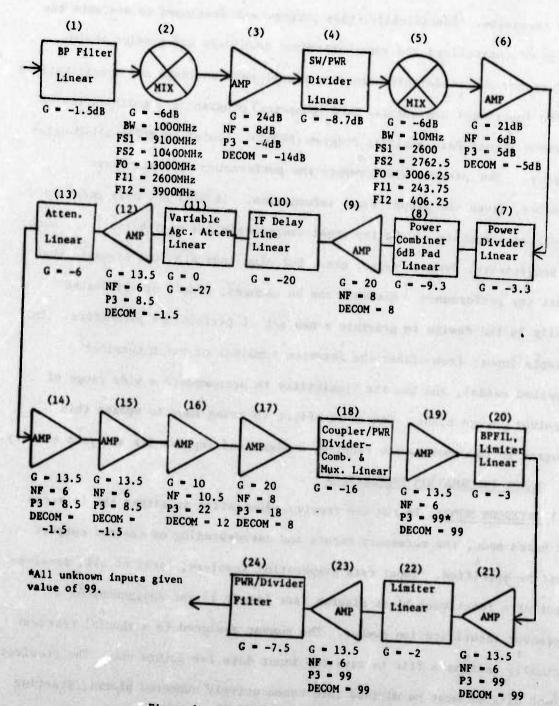


Figure 1 RECEIVER BLOCK DIAGRAM SAMPLE

blocks specified includes all of the components from the input to the detector (which is not included in this program). Each functional block is assigned a number and block-type. A maximum of 50 blocks is permitted. Four block types can be handled by the program: Amplifier, Linear, Mixer, and Fold. The pertinent data required for each block type are listed below:

- A. Amplifier: All active elements in the receiver signal path, such as amplifiers, belong to this class. The gain (G) and noise figure (NF) in dB, third order intermodulation (intermod) intercept point (P3), and 1 dB compression point (DECOM), all referred to input, are the necessary input information.
- B. Mixer: The required inputs for this type block are the mixer gain or loss in dB (negative dB's for conversion loss), the third order intermodulation intercept point (referred to input), 1 dB compression point (referred to input), input frequency range (FS1 to FS2), local oscillator frequency (FO), output frequency range (FI1 to FI2), and the desired resolution bandwidth (BW). This resolution bandwidth has no relation to the input or output frequency range. It is used to calculate the sensitivity, therefore, the narrowest bandwidth in the signal path before the detector is generally used. The input and output frequency ranges are used to predict the inband spurious responses (spurs). All frequencies are in MHz.
- C. Linear Elements: All passive components such as filters, power dividers, attenuators, etc., are classified as linear. Even some of the nonlinear elements, such as limiters, are classified as linear; therefore, the intermod of the limiter cannot be predicted. Most of these elements are passive and their linear region is assumed infinite or (99 dB) in the

program. The necessary input information is insertion loss (designated as negative gain in dB). The linear elements are divided into two groups (fixed gain and variable gain elements). Elements with fixed loss require only one input. If the element has variable losses, maximum and minimum values are needed.

D. Fold: This imaginary block is used to permit computation of the noise performance of channelized receivers when several parallel front ends or input branches are combined in a single output. The present program will only permit the combination of receiver front ends with identical noise figures for the signal path up to the power combiners. Front ends having different noise figures must be calculated separately since each individual network may have its own bandwidth, noise, and gain. Provisions for combining the net noise of front ends with different noise figures were not incorporated in this program. To analyze receiver performance in the fold mode, the number of identical branches to be combined must be specified. Zero insertion loss and 99 dB dynamic range are assumed for this block.

The insertion loss of the power combiner can be expressed by a linear element following the fold block.

In all elements, an output bandwidth of 2.0 GHz is automatically assumed unless it is critical to the computation involved; in which case, the output bandwidth is specified. The engineer has to use his judgment on inserting the right information. For example, in cases where an amplifier follows a limiter, the dynamic range of the amplifier is not significant, since the level of intermod products generated in the limiter restrict overall receiver dynamic range. Therefore, in the design procedure, the limiter has to either follow the last filter or provision must be made to

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avoid more than one signal being present at the limiter simultaneously.

2.2 BATCH MODE: To run a batch receiver simulation, a card deck is required. The program places the data on a file called TAPEl so the simulation program can treat it as a previously defined receiver. The only card input to the program is the receiver number, which must be greater than 50.

The input format for receiver data is as follows:

Card Type 1

col 1 - 2 receiver number

3 - 4 number of blocks

NOTE: Any value omitted in card types 2 or 3 will be treated as a zero value. A decimal point must be present in any value input.

Card Type 2

col 1 - 10 max gain

11 - 20 max noise

21 - 30 min gain

31 - 40 min noise

41 - 50 third order intercept

51 - 60 bandwidth

61 - 80 not used by program; available for comments

Note: For a fold block columns 1 - 50 must be zeros.

Card Type 3

col 1 - 10, 1 dB compression point

11 - 20 lower limit of RF input frequency

21 - 30 upper limit of RF input frequency

31 - 40 local oscillator frequency

Select Little with are whom odd to which love

- 41 50 lower limit of IF input frequency
- 51 60 upper limit of IF input frequency
- 61-80 not used by program; available for comments Note: For a fold block, columns 1-11 must be zero and columns 51-60 the number of parallel branches folded.

A card of each type must be present for each block in the receiver. The cards <u>must</u> be in ascending block number order with all type 2's preceding the type 3's, also in block number order.

To run multiple receivers, simply add data decks after first receiver data.

# 3. PROGRAM CHOICES

- 3.1 INTERCOM MODE OPERATION: To run the program in the intercom mode, required input data are fed to the computer through a simple question and answer procedure. These questions are self explanatory. For example, the user types in a number (integer 1 to 50) in answer to the question "Receiver Number?". This number identifies the receiver and its associated data file for future use. The user types in YES or NO depending on whether or not a data file has been opened previously for the receiver number identified. Subsequent input data are fed to the computer in a similar manner (see sample printout in Appendix A). A YES or NO answer enables or inhibits in turn, computation of the following parameters:
  - 1. Noise figure and sensitivity.
- Third order intermodulation products (intermods) and the amplitudes of the input signals where the third order intermod equals noise level.
- 3. All inband spurious responses (spurs) to the 6th order. The amplitude of the spurs are not calculated.

4. The one (1) dB compression dynamic range.

After all of the inputs are fed into the computer, the program then lists all the source data in tabulated form and gives the user an opportunity to edit the data prior to running the program. Editing provisions in the program permit correcting any errors observed in the listed input data. The user may change, add or delete a block; however, he must specify the type of change desired and identify the proper block number to correct data or delete a block. A block may be added by inserting the preceding block number, then all of the block numbers following the added block will automatically be increased by one. When new information is inserted for a change or add block, twelve columns of data are required. The columns of data are maximum and minimum values of gain, noise figure (in case of linear elements it is a positive number which equals to the loss of the element), third order intercept point, bandwidth, one dB compression point, lower limit of input frequency, upper limit of input frequency, local oscillator frequency, lower limit of IF output, and upper limit of IF output. Examples of editing input data are given in Appendix A. 4.0 OUTPUT INFORMATION: The output information is explained briefly in the computer printout form. Their significance will be explained as follows: The computer will use all the maximum values and all the minimum values in the variable linear computation. The tabulated results of noise figure performance, third order intermod performance, and dynamic range are listed for the receiver maximum and minimum gain conditions.

## 4.1 NOISE FIGURE PERFORMANCE TABLE

The qualities FTOT, FRAC, CUM, F(I), and SEN are printed out in the noise figure table by block number for maximum and minimum receiver gains.

The standard formulas used for computing these quantities are listed in Appendix B.

FTOT: Noise figure from the first block all the way to the I-th Block and the noise figure after the I-th block.

FRAC: Percentage of noise contribution from the I-th block. If one wants to improve the noise figure the blocks with the higher percentage will be fixed first.

CUM: Sum of FRAC from the 1st to the I-th block.

F(I): Noise figure in dB looking into the I-th block.

SEN: Sensitivity in dBm looking into the I-th block with a signal to noise ratio of 0 dB.

## 4.2 THIRD ORDER INTERMOD PERFORMANCE

The third order intermed performance table is a printout of P3TOT, FRAC, CUM, P3(I), and Q.

P3TOT: Third order intercept point (referred at the input of the receiver) from the lst block to the I-th block.

FRAC: Relative intermod degradation contributed by each block. Note that the block which has the largest value limits the intermod of the receiver.

CUM: Sum of FRAC for the first I blocks.

P3(I): Third order intercept in dBm looking into the I-th block.

Q: Power level of two equal amplitude signals applied into the I-th block which produce intermods equal to the noise level.

The key parameters in this table that are useful in evaluating the receiver's intermod performance are the intercept point, P3(I), FRAC, and Q. Due to the inherent nonlinearities of amplifiers and mixers used in receivers,

intermodulation and harmonic distortion products are generated which limit the dynamic range. The level of the distortion product relative to the signal level can be calculated from the intercept point, or conversly, the intercept point can be calculated from the relative suppression (SEN-Q). The intercept point is the theoretical point of intersection of fundamental response and the third order response curves, and is shown in figure 2 for the receiver third order two tone performance characteristics. The range from SEN to Q gives the dynamic range of the receiver (usually referred to as two tone dynamic range). For example, suppose one desires to determine the two tone dynamic range (DR) of the receiver in figure 1, where the third order intercept point  $(P_3(1)^{\infty}-10.5 \text{ dBm})$ , noise figure (F(1)n=24.2 dB), and the receiver's resolution bandwidth (BW=10 MHz) are given. The sensitivity (SEN), Q, and two tone dynamic can be computed.

SEN = -114 dBm + F(I) + 10 log 
$$\frac{BW(MHz)}{1 \text{ MHz}}$$

= -114 + 24.2 + 10 = -79.8 dBm

Q = 1/3 SEN + 2/3 
$$P_3(I) = -79.8/3 + 2/3 (-10.5) = -33.6 dBm$$

$$DR = |SEN-Q| = |-79.8 - (-33.6)| = 46.2 dB$$

Note how close the above values, the tabulated printouts for block 1, and the values obtained from figure 2 agree. Laboratory measurements of the channelized receiver's performance confirmed the tabulated computer printouts.

- 4.3 <u>DYNAMIC RANGE COMPUTATION</u>: This table lists the quantities G, DECOM, DTOT, GTOT, and D(I) which may be used to compute the 1 dB compression dynamic range.
- G: Gain in dB of I-th block

DECOM: 1 dB compression point of block I (referred at the input of the component).

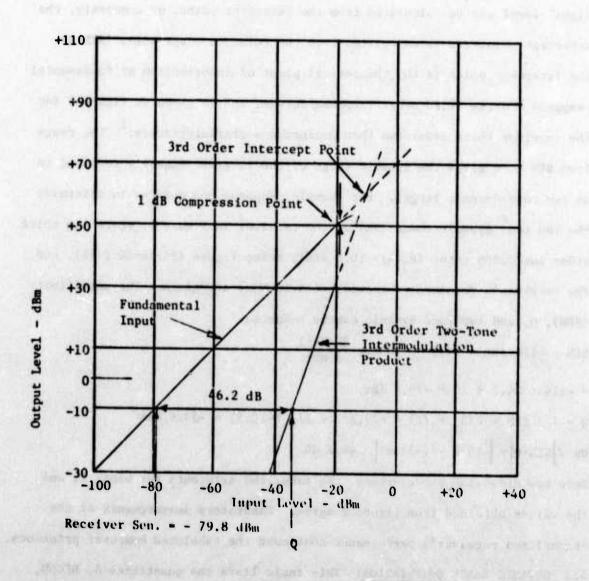


Figure 2. Typical Third Order Intermodulation Performance

(Mintmim Cafn Condition)

DTOT: Is the 1 dB compression of the first I blocks

GTOT: Is the sum of G

D(J): Is the 1 dB compression point looking into Ith block

The dynamic range of a receiver for a signal can be defined as the range between the input signal level that causes 1 dB of gain compression and the minimum input signal level that can be detected above the receivers noise level.

4.4 SPUR COMPUTATIONS: The spur table lists the quantities FSA, FSB, FSC, and FSD for each spur (combination of signal frequency multiple M, and local oscillator multiple N for M and N = 0 thru 6). These quantities identify the the intersection of the spur and the intermediate frequency (IF) output as shown in the mixer spurious effects chart of figure 3. The heavy line shows the variation of normalized output frequency (H-L)/H with the normalized input frequency (L/H). H = the high input frequency; L = the low input frequency. FSA: Frequency at which MFS-NFO intercepts the lower limit of the IF (FII), where FS and FO are the signal and local oscillator frequencies respectively. Note that in figure 1 the local oscillator frequency is the high input and the signal frequency is the low input.

FSB: Frequency at which MFS-NFO intercepts the upper limit of IF (FI2).

FSC: Frequency at which NFO-MFS intercepts FI1

FSD: Frequency at which NFO-MFS intercepts FI2.

# 5. CONCLUSIONS AND RECOMMENDATIONS

5.1 <u>CONCLUSIONS</u>: In conclusion, the receiver signal path analysis program serves as a convenient tool for applying computer modeling to expedite receiver performance evaluation. Although there are various other ways of implementing receiver modeling, the signal path analysis approach is

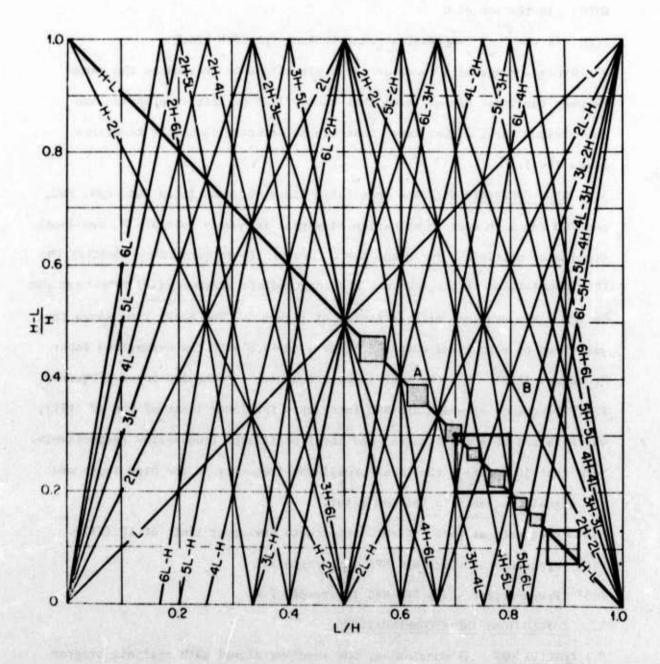


Figure 3. Down-Converter Spurious-Effects Chart; II = High
Input Frequency, L = Low Input Frequency

simple and straightforward. It requires only a block diagram of the receiver signal path and inputs of component specifications, such as gain, noise figure, and intermod intercept point. The program output not only generates important receiver performance characteristics, such as sensitivity, dynamic range, and spurious products, but also indicates which element limits receiver performance by generating the percentage of contribution by each component to the noise performance of a receiver.

This modeling program is of significance to the Air Force since it permits the following:

- Aids subsystem definition and specification by determining performance characteristics of a particular receiver design affecting requirments for system maximum and minimum operating ranges.
- 2. Serves as an engineering tool for receiver proposal evaluation where it is necessary to determine whether sufficient information is provided to determine overall system performance. It can be used to determine whether the overall performance characteristics proposed satisfies requirements based on performance data of the functional blocks.
- 3. Serves as a systematic analysis tool for evaluating, testing, and designing valid and promising receiver approaches.
- 5.2 <u>RECOMMENDATIONS</u>: Experimental results as well as the experience gained during program evaluation, using the High Probability Intercept Receiver (HPIR) developed under contract F33615-74-C-1225, clearly indicate that although this receiver analysis program (RAP) is an effective tool, the following refinements in the program should be provided:

- 1. Provide and improve capability for evaluating the noise performance at channelized receivers in the fold mode by incorporating algorithms in the program which permit combining several parallel receiver front ends (each having its own bandwidth, gain, and noise figure) into a single output.
- Incorporate a capability for predicting the receivers probability detection and false alarm rate depending on system configuration and signalto-noise ratio.

## REFERENCES

- 1. Skolnik, M. I., <u>Introduction to Radar Systems</u>, Chap. 8, McGraw-Hill Book Company, New York, 1962.
- 2. Chiedle, D. L., Thin-Film Cascadable Amplifiers, Watkins-Johnson Application Note, 100051-075A, August 1975.
- 3. Skolnik, M. I., Radar Handbook, Sec. 5.4, McGraw-Hill Book Company, New York, 1970.
- 4. Reference Data for Radio Engineers, Chap. 27 29, Howard W. Sam & Co., Inc., 1968.

#### APPENDIX A

#### DATA INPUT AND EDITING

#### A.1 INTRODUCTION

The purpose of this appendix is to demonstrate the capability of the receiver analysis program. Considerable flexibility is provided for editing input data as shown in the examples given below. Data can be corrected during input; however, addition or deletion of a functional block must be accomplished after all data are listed.

# A.2 INPUT PROCEDURE AND EDITING NEW RECEIVER DATA FILE

The receiver used in the following example is shown in figure 1. Some incorrect data for blocks 2 and 5 are deliberately put into the system. When the computer lists all input data, the error in block 5 data (there is a loss in this block of -6 dB instead of a 6 dB gain) is noticed and corrected immediately. The error, however, in block 2 data is unnoticed although it will be corrected in example 2. A printout of the data entry procedure and results of the editing is given below. These results are saved on the tape for example 2.

CALBO SIDER TORROTTO THE ENGINE CHARLET BUT ALT DO SADE CONTROL CONDUCTOR CONTROL

THE CAPPARATE BLOOD THREET ALTERNA NEW LIFERS WE TA

人名英克里斯特拉克 (10 Part - 10 - 10 Part Turbell

RECEIVER SIGNAL FATH PARAMETERS

```
IMPUT: RECEIVER NUMBER (ANSWER INTEGER 1 TO 50)
 PERFORM HOISE FIGURE COMPUTATIONS? (ANSWER YES OR HO)
        YES
 PERFORM INTERMOD COMPUTATIONS? (ANSWER YES OR NO)
        YES
 PERFORM DYNAMIC MANGE COMPUTATIONS? (ANSWER YES OR NO)
        YES
 FERFORM SPUR COMPUTATIONS? (ANSWER YES OR NO)
 HAS A FILE BEEN OPENED PREVIOUSLY FOR THE DATA FOR
 THIS RECEIVER? (ANSWER YES OR NO)
        NO
 INPUT: NUMBER OF BLOCKS (INTEGER ANSWER: 1 TO 50)
        24
 ACCEPTABLE BLOCK TYPES: LINEAR, AMPLIFIER, MIXER
 INPUT:TYPE:BLOCK 1
        LIN
 IS GAIN FIMED OR VARIABLE?
       FIX
INPUT: GAIN (D)
INPUT 103 COMPRESSION POINT(REFER TO INPUT LEVEL)
IF UNKNOWN ENTER 99.
       99
ACCEPTABLE BLOCK TYPES: LINEAR, AMPLIFIER, MIXER
INPUT: TYPE , BLOCK 2
       MIX
INPUT:MIXER GAIN(DE).CUTPUT BANDWIDTH(MHZ)
HOTE:GAIN(DB) IS NEGATIVE FOR CONVERSION LOSS
       -6,1000.
INPUT DATA FOR SPUR CONFUTATIONS
         INPUT FREQUENCY BAND(2 VALUES)
 INPUT:
         LOCAL DSCILLATOR FREQUENCY
         DUTPUT FREQUENCY BAND(2 VALUES)
ENTER 99. FOR UNKNOWN VALUES
       9:00,10400,1300,2600,3900
INPUT: INTERMOD INTERCEPTS (DSN) FTHIRD ORDER
NOTE: WRITE SO FOR UNKNOWN INTERCEPT
       99
INPUT 1DS COMPRESSION POINT(REFER TO INPUT LEVEL)
IF UPKNOWN ENTER 99.
ACCEPTABLE BLOCK TYPES: LINEAR. AMPLIFIER, MIXER
INFUT: TYPE . BLOCK 3
       AMP
IMPUT:GAIN(DB):MBISE FIGURE(DB)
      24,8
```

```
INPUT: INTERMOD INTERCEPTS (DEMOSTHIRD OPDER
NOTE: WRITE 99 FOR UNKNOWN INTERCEPT
INPUT 1D% COMPRESSION POINT(REFER TO INPUT LEVEL)
IF UNKNOWN ENTER 99.
       -14
ACCEPTABLE BLOCK TYPES: LINEAR, AMPLIFIER, MIXER
IMPUT: TYPE : PLOCK 4
       LIN
IS GAIN FIXED OR VARIABLE?
       FIX
IMPUT:GAIN(DR)
       -8.7
INPUT 1DB COMPRESSION POINT(REFER TO INPUT LEVEL)
IF UNKNOWN ENTER 99.
ACCEPTABLE BLOCK TYPES: LINEAR & AMPLIFIER, MIXER
INPUT: TYPE , BLOCK 5
       MIX
INPUT:MIMER GAIN(DB) DUTPUT BANDWIDTH(MHZ)
NOTE:GAIN(DB) IS NEGATIVE FOR CONVERSION LOSS
       6,10
INPUT DATA FOR SPUR COMPUTATIONS
 INPUT: INPUT FREQUENCY BAND(2 VALUES):
         LOCAL COCILLATOR FREQUENCY
         BUTPUT FREQUENCY BAND(8 VALUES)
ENTER 99. FOR UNKNOWN VALUES
       2600,2762.5,3006.25,243.75,406.25
INPUT: INTERMOD INTERCEPTS (DEN) THIPD ORDER
NOTE: WRITE 99 FOR UNKNOWN INTERCEPT
INPUT 1DB COMPRESSION POINT(REFER TO INPUT LEVEL)
IF UNKNOWN ENTER 99.
7
       99
ACCEPTABLE BLOCK TYPES: LINEAR, AMPLIFIER, MIXER
INPUT: TYPE , BLOCK 6
UNACCEPTABLE ANGWER
ACCEPTABLE BLOCK TYPES: LINEAR, AMPLIFIER, MINER
INPUT: TYPE . BLOCK 6
       AMP
INPUT: GAIN(DA) *NOICE FIGURE(DA)
       21.6
INPUT: INTERMOD INTERCEPTO/DEHD THIRD OFDER
NOTE: WHITE 99 FOR UNINDWN INTERCEPT
IMPUT 1DB COMPRESSION POINT PEFER TO IMPUT LEVELS
IF UNKNOWN ENTER 99.
ACCEPTABLE BLOCK TYPES: LINEAR. AMPLIFIER. MINER
IMPUT: TYPE - TUBER 7
      LIH
10 GAIN FINED OF VHEIBBLET
       FIX
```

```
IMPUT:SAIN(DB)
        -3.3
 IMPUT 1DB COMPRESSION FOINT(PEFER TO IMPUT LEVEL)
  IF UNKNOWN ENTER 99.
 ACCEPTABLE BLOCK TYPES: LINEAR, AMPLIFIER, MIMER
 INPUT:TYPE:BLOCK &
 IS GAIN FIMED OF VARIABLE?
        FIX
 IMPUT (GAIN (DB)
        -9.3
 INPUT 1DB COMPRESSION POINT(REFER TO INPUT LEVEL)
 IF UNKNOWN ENTER 99.
        99
 ACCEPTABLE BLOCK TYPES: LINEAR, AMPLIFIER, MIXER
 INPUT: TYPE, BLOCK 9
        AMP
 INPUT: GAIN (DB) . HOISE FIGURE (DB)
        20,8
 INPUT: INTERMOD INTERCEPTS (DBN) THIRD ORDER
 HOTE: WRITE 99 FOR UNKNOWN INTERCEPT
 INPUT 1DB COMPRESSION POINT(REFER TO INPUT LEVEL)
 IF UNKNOWN ENTER 99.
ACCEPTABLE BLOCK TYPES: LINEAR, AMPLIFIER, MIXER
 INPUT: TYPE . BLOCK 10
       LIN
IS GAIN FIXED OR VARIABLE?
       FIX
 INPUT : GA IN (DB)
       -20
INPUT 1DB COMPRESSION POINT(REFER TO INPUT LEVEL)
IF UNKNOWN ENTER 99.
       LIN
 ERROR-PETYPE RECORD BEGINNING WITH FIELD AT ARROW
ACCEPTABLE BLOCK TYPES: LINEAR, AMPLIFIER, MIXER
INPUT:TYPE:BLOCK 11
7
       LIN
IS GAIN FIXED OR VARIABLE?
INPUT: MAXIMUM GAIN(DB) . MINIMUM GAIN(DB)
INPUT 108 COMPRESSION POINT (PEFER TO INPUT LEVEL)
IF UMANDUM ENTER 99.
       99
ACCEPTABLE BLOCK TYPES: LINEAR, AMPLIFIER, MIMER
IMPUT:TYPE, BLOCK 12
INPUT:GAIN(DE) .NDISE FIGURE(DE)
       13.5,6
```

```
IMPUT: INTERMOD INTERCEPTS (DBM) (THIRD DRDER
 NOTE: WRITE 95 FOR UNKNOWN INTERCEPT
        8.5
 INPUT 108 COMPRESSION FOINT (REFER TO INPUT LEVEL)
 IF UNKHOWN ENTER 99.
        -1.5
 ACCEPTABLE BLOCK TYPES: LINEAR, AMPLIFIER, MIKER
 IMPUT: TYPE .BLOCK 13
        LIN
 IS GAIN FIXED OR VARIABLE?
        FIX
 IMPUT: GAIN (DB)
        -6
 INFUT 1DB COMPRESSION POINT(PEFER TO INPUT LEVEL)
 IF UNKNOWN ENTER 99.
        99
 ACCEPTABLE BLOCK TYPES: LINEAR, AMPLIFIER, MIXER
 INPUT: TYPE . BLOCK 14
 INPUT: GAIN(DB), NOISE FIGURE(DB)
        13.5
 IMPUT: INTERMOD INTERCEPTS (DBM) (THIRD ORDER
 HOTE: WRITE 99 FOR UNKNOWN INTERCEPT
        8.5
 INPUT 1DB COMPRESSION POINT(REFER TO INPUT LEVEL)
 IF UNKNOWN ENTER 99.
       -1.5
ACCEPTABLE BLOCK TYPES: LINEAR, AMPLIFIER, MIXER
INPUT: TYPE . BLOCK 15
        AMP
INPUT: GAIN (DB) , NOISE FIGURE (DB)
       13.5,6
INPUT: INTERMOD INTERCEPTS (DBM) (THIRD ORDER
NOTE: WRITE 99 FOR UNKNOWN INTERCEPT
       8.5
INPUT 1D3 COMPRESSION POINT(REFER TO INFUT LEVEL)
IF UNKNOWN ENTER 99.
       -1.5
ACCEPTABLE BLOCK TYPES: LINEAR, AMFLIFIER, MIXER
INPUT: TYPE , BLOCK 16
       AMP
INPUT:GAIN(DB), NOISE FIGURE(DB)
       10,10.5
IMPUT: INTERMOD INTERCEPTS (DEN) THIRD ORDER
NOTE: WRITE 99 FOR UNKNOWN INTERCEPT
       22
INPUT 1DB COMPRESSION POINT(REFER TO IMPUT LEVEL)
IF UNKNOWN ENTER 99.
ACCEPTABLE BLOCK TYPES: LINEAR, AMPLIFIER, MIXER
INPUT: TYPE , BLOCK 17
      AMP
```

```
IMPUT:GAIN(DB) (MOISE FIGURE(DB)
         20,8
  INPUT: INTERMOD INTERCEPTS (DBN) (THIRD ORDER
  NOTE: WRITE 99 FOR LANADWA INTERCEPT
         18
  INPUT 1DB COMPPESSION FOINT(REFER TO INPUT LEVEL)
  IF UNKNOWN ENTER 99.
  ACCEPTABLE BLOCK TYPES: LINEAR, AMPLIFIER, MIXER INPUT:TYPE, BLOCK 18
        LIN
  13 GAIN FIXED OR VARIABLE?
        FIX
 INPUT:GAIN(DB)
        -16
 INPUT 1DB COMPRESSION POINT(PEFER TO INPUT LEVEL)
 IF UNKNOWN ENTER 99.
 ACCEPTABLE BLOCK TYPES: LINEAR, AMPLIFIER, MIXER
 INPUT:TYPE, BLOCK 19
 IMPUT: GAIN (DB) + MDISE FIGURE (DB)
        13.5,6
 INFUT: INTERMOD INTERCEPTS (DBN) THIRD ORDER
 NOTE: WRITE 99 FOR UNKNOWN INTERCEPT
 INPUT 100 COMPRESSION POINT (REFER TO INPUT LEVEL)
 IF UNKNOWN ENTER 99.
        99
 ACCEPTABLE BLOCK TYPES: LINEAR, AMPLIFIER, MIXER
 INPUT: TYPE , BLOCK 20
       LIN
IS GAIN FIXED OR VARIABLE?
       FIX
 INPUT:GAIN(DB)
IMPUT 1DB COMPRESSION POINT (REFER TO IMPUT LEVEL)
IF UNKNOWN ENTER 99.
ACCEPTABLE BLOCK TYPES: LINEAR, AMPLIFIER, MIXER
IMPUT: TYPE, BLOCK 21
       AMP
INPUT:GAIN(DB), NDISE FIGURE(DB)
       13.5,6
INPUT: INTERMOD INTERCEPTS (DBM) THIRD ORDER
NOTE: WRITE 99 FOR UNKNOWN INTERCEPT
INPUT 108 COMPRESSION POINT(REFER TO INPUT LEVEL)
IF UNKNOWN ENTER 99.
       99
ACCEPTABLE BLOCK TYPES: LINEAR, AMPLIFIER, MIXER
```

```
INPUT: TYPE : BLOCK 22
                                           LIN
                 IS GAIN FIXED OR VARIABLE?
                                            FIX
               7
           INPUT:GAIN(DB)
                7 -2
             INPUT 1DB COMPRESSION POINT(REFER TO INPUT LEVEL)
                IF UNKNOWN ENTER 99.
                 ACCEPTABLE BLOCK TYPES: LINEAR, AMPLIFIER, MIXER
                 INPUT: TYPE , BLUCK 23
                                          AMP
                IMPUT: GAIN (DE) MOISE FIGURE (DE)
                                          13.5,6
                INPUT: INTERMOD INTERCEPTS (DBN) THIRD OPDER
                NOTE: WRITE 99 FOR UNKNOWN INTERCEPT
                                           99
            INPUT 109 COMPRESSION POINT(REFER TO IMPUT LEVEL)
           IF UNKNOWN ENTER 99.
           ACCEPTABLE BLOCK TYPES: LINEAR, AMPLIFIER, MIXER
                 INPUT: TYPE . BLOCK 24
                                           LIN
                  IS GAIN FIXED OR VARIABLE?
                                             FIX
                 INPUT: GAIN (DB)
              7
                                           -7.5
INPUT 1DB COMPRESSION POINT(REFER TO INPUT LEVEL)
                  IF UNKNOWN ENTER 99.
                                             99
                                                                                                                              The state of the s
```

DATA				11111		
	MAXIMU	M GAIN	MINIMU	M GAIN		
BLOCK	6	F	6	F	Р3	Bω
1	-1.5	1.5	-1.5	1.5	99.0	2000.000
2	-6.0	6.0	-6.0	6.0	99.0	1000.000
3	24.0	8.0	24.0	8.0	-4.0	2000.000
4	-8.7	8.7	-8.7	3.7	99.0	2000.000
5	6.0	6.0	6.0	6.0	99.0	10.000
6 7	21.0	6.0	21.0	6.0	5.0	2000.000
7	-3.3	3.3	-3.3	3.3	99.0	2000.000
8	-9.3	9.3	-9.3	9.3	99.0	2000.000
9	20.0	8.0	20.0	8.0	18.0	2000.000
10	-20.0	20.0	-20.0	20.0	99.0	2000.000
11	0.0	0.0	-27.0	27.0	99.0	2000.000
12	13.5	6.0	13.5	6.0	8.5	2000.000
13	-6.0	6.0	-6.0	6.0	99.0	2000.000
14	13.5	6.0	13.5	6.0	8.5	2000.000
15	13.5	6.0	13.5	6.0	8.5	2000.000
16	10.0	10.5	10.00	10.5	22.0	2000.000
17	20.0	8.0	20.0	8.0	18.0	2000.000
18	-16.0	16.0	-16.0	16.0	99.0	2000.000
19	13.5	6.0	13.5	6.0	99.0	2000.000
20	-3.0	3.0	-3.0	3.0	99.0	2000.000
21	13.5	6.0	13.5	6.0	99.0	2000.000
55	-2.0	2.0	-2.0	2.0	99.0	2000.000
23	13.5	6.0	13.5	6.0	99.0	2000.000
24	-7.5	7.5	-7.5	7.5	99.0	2000.000
I=BLOCK (					CLASSIC MAN	
G=GAIN(D)						
	FIGURE(DB),					
NOTE : F=LI		AH ATTENL	JATOR			
P3=THIRD	BRDER INTE	RCEPTS(DB)	D FELDOK I			

• , •			•	•		
DATA			-	- 9		
BLOCK	DECOM	FS1	FS2	FO	FI1	FIE
1	99.0	0.0	0.0	0.0	0.0	0.000
2	99.0	9100.0	10400.0	1306.0	2600.0	3900.000
3	-14.0	0.0	0.0	0.0	0.0	0.000
4	99.0	0.0	0.0	0.0	0.0	0.000
5	99.0	2600.0	2762.5	3006.3	243.8	406.250
6	-5.0	0.0	0.0	0.0	0.0	0.000
7	99.0	0.0	0.0	0.0	0.0	0.000
8	99.0	0.0	0.0	0.0	0.0	0.000
9	8.0	0.0	0.0	0.0	0.0	0.000
10	99.0	0.0	0.0	0.0	0.0	0.000
11	99.0	0.0	0.0	0.0	0.0	0.000
12	-1.5	0.0	0.0	0.0	0.0	0.000
13	99.0	0.0	0.0	0.0	0.0	0.000
14	-1.5	0.0	0.0	0.0	0.0	0.000
15	-1.5	0.0	0.0	0.0	0.0	0.000
16	12.0	0.0	0.0	0.0	0.0	0.000
17	8.0	0.0	0.0	0.0	0.0	0.000
18	99.0	0.0	0.0	0.0	0.0	0.000
19	99.0	0.0	0.0	0.0	0.0	0.000
20	99.0	0.0	0.0	0.0	0.0	0.000
21	99.0	0.0	0.0	0.0	0.0	0.000
25	99.0	0.0	0.0	0.0	0.0	0.000
23	99.0	0.0	0.0	0.0	0.0	0.000
24	99.0	0.0	0.0	0.0	0.0	0.000
I=BLOCK I						
	DE COMPRESS				JENCY	
FS1=LOWE		RF INPUT				
FS2=UPPE			FREQUENCY			
	DSCILLATOR					
FI1=LOWE			FREQUENCY			
FI2=UPPE	R LIMIT OF	IF INPUT	FREQUENCY			

```
IS DATA CORRECT? ANSWER YES OR NO

? NO
INPUT TYPE OF CHANGE: ADD, CHG, DEL, OR END(TO STOP EDIT)
? CHG
INPUT: BLOCK NUMBER
NOTE: FOR ADD ENTER PRECEDING BLOCK NUMBER
? 5
INPUT DATA COLUMNS(IN ORDER, 12 VALUES)
NOTE: 6TH VALUE IS SENSITIVITY(MIXER ONLY)
? -6,6,-6,6,99,10,99,2600,2762.5,3006.25,243.75,406.25
INPUT TYPE OF CHANGE: ADD, CHG, DEL, OR END(TO STOP EDIT)
? END
```

# A.2.1. Printout After Data Correction

DATA		1,002	•	•	•	
	MAX	IMUM GAIN	11M	NIMUM GAIN	4	
BLOCK	6	S.O. F	6	1000	100	
1	-1.5	1.5		The state of the s		
2	-6.0	6.0	-1.5			
3	24.0	8.0	-6.0			
4	-8.7	8.7	24.0			000.000
5	-6.0	6.0	-8.7			2000.000
6	21.0	6.0	-6.0			10.000
7	-3.3	3.3	21.0			2000.000
8	-9.3	9.3	-3.3			2000.000
9	20.0		-9.3			2000.000
10	-20.0	8.0	20.0		0 18.0	2000.000
11	0.0	20.0	-20.0		99.0	
12	13.5	0.0	-27.0	27.	0 99.0	
13	-6.0	6.0	13.5	6.	0 8.5	
14	13.5	6.0	-6.0	6.		- A A A A A A A A A A A A A A A A A A A
15		6.0	13.5	6.	0 8.5	
16	13.5	6.0	13.5	6.		2000.000
17	10.0	10.5	10.0	10.5		2000.000
18	20.0	8.0	20.0	8.0		2000.000
19	-16.0	16.0	-16.0	16.0		2000.000
20	13.5	6.0	13.5	6.0		2000.000
21	-3.0	3.0	-3.0	3.0		2000.000
	13.5	6.0	13.5	6.0		2000.000
22	-2.0	2.0	-2.0	ž.		2000.000
23	13.5	6.0	13.5	6.0		2000.000
24	-7.5	7.5	-7.5	7.5		2000.000
I=BLOCK NU	MBER		Provide and a land	( • •	99.0	2000.000
G=GAIN(DB)	BLOCK I					
F=NOISE FI	GURE (DB)	BLOCK I			SEL TOWN	
HUTE:F=LOS	S(DB) FO	P AN ATTEN	WATER			
P3=THIRD D	RDER INT	ERCEPTS(DE	M) BLOCK	1		

THE OWNER WHEN THE PROPERTY WENT OF

TOWNERS AND SHIPE PARTY DATES TO THE TOWNERS AND STREET

eredi agre di igre se visco ecologia a se senti del agri como

CHALLOW STATES AND ALL TYPE AND

• •			•	•	•	
DATA						
BLOCK	DECOM	FS1	FS2	FD	FI1	FI2
1	99.0	0.0	0.0	0.0	0.0	0.000
2	99.0	9100.0	10400.0	1300.0	2600.0	3900.000
3	-14.0	0.0	0.0	0.0	0.0	0.000
4	99.0	0.0	0.0	0.0	0.0	0.060
5 1114	99.0	2600.0	2762.5	3006.3	243.8	406.250
6	-5.0	0.0	0.0	0.0	0.0	0.000
7	99.0	0.0	0.0	0.0	0.0	0.000
8	99.0	0.0	0.0	0.0	0.0	0.000
9	8.0	0.0	0.0	0.0	0.0	0.000
10	99.0	0.0	0.0	0.0	0.0	0.000
11	99.0	0.0	0.0	0.0	0.0	0.000
12	-1.5	0.0	0.0	0.0	0.0	0.000
13	99.0	0.0	0.0	0.0	0.0	0.000
14	-1.5	0.0	0.0	0.0	0.0	0.000
15	-1.5	0.0	0.0	0.0	0.0	0.000
16	12.0	0.0	0.0	0.0	0.0	0.000
17	8.0	0.0	0.0	0.0	0.0	0.000
18	99.0	0.0	0.0	0.0	0.0	0.000
19	99.0	0.0	0.0	0.0	0.0	0.000
20	99.0	0.0	0.0	0.0	0.0	0.000
21	99.0	0.0	0.0	0.0	0.0	0.000
22	99.0	0.0	0.0	0.0	0.0	0.000
23	99.0	0.0	0.0	0.0	0.0	0.000
24	99.0	0.0	0.0	0.0	0.0	0.000
	NUMBER	7001	ASL TATEL	2001	2x4=4t(0===	
	B COMPRESS			INPUT FRE	EQUENCY	
FS1=LOWER			FREQUENCY			
FS2=UPFER			FREQUENCY			
FD≃LDCAL FI1≃LDWER	DECILLATOR				1	
			FREQUENCY			
FI2=UPPER	LIMIT OF	IF INPUT	FREQUENCY			
					The Ass. Dollar	
NAME OF TAXABLE PARTY.			T. Vander on			
			ADESS DIE	Bulliania	SA PERMIT	
IS DATA C	ORRECT? AN	ISMER YES	OR NO			

HOI	SE FIG	UPE PERI								
			MAXII	MUM GAI	Н			MUMINIM	GAIN	
BLO	CK FTD	T FRAC	CUM	F(I)	SEN	FTOT	FEAC	CUM	F(I)	SEN
1	1.5	.036	.036	15.9	-88.1	1.5	.005	.005	24.2	-79.8
2	7.5	.108	.144	14.4	-89.6	7.5	.016	.021	22.7	-81.3
3	15.5	.763	.907	8.4	-95.6	15.5	.114	.135	16.7	-87.3
4	15.5	.004	.910	22.1	-81.9	15.5	.001	.136	40.1	-63.9
5	15.6	.013	.923	13.4	-90.6	15.6	.002	.138	31.4	-72.6
6	15.8	.050	.973	7.4	-96.6	15.8	.008	.145	25.4	-78.6
7		.000	.974	23.0	-81.0	15.8	.000	.145	46.3	-57.7
8	15.8	.002	.976	19.7	-84.3	15.8	.000	.146	43.0	-61.0
9	15.9	.013	.989	10.4	-93.6	15.9	.002	.147	33.7	-70.3
10	15.9	.002	.991	26.7	-77.3	15.9	.000	.148	53.7	-50.3
11	15.9	0.000	.991	6.7	-97.3	19.4	.182	.330	33.7	-70.3
12	15.9	.007	.998	6.7	-97.3	23.6	.544	.874	6.7	-97.3
13	15.9	.000	.999	12.2	-91.8	23.7	.024	.898	12.2	-91.8
14	15.9	.001	1.000	6.2	-97.8	24.2	.097	.995	6.2	-97.8
15	15.9	.000	1.000	6.5	-97.5	24.2	.004	.999	6.5	-97.5
16	15.9	.000	1.000	10.8	-93.2	24.2	.001	1.000	10.8	-93.2
17	15.9	.000	1.000	9.0	-95.0	24.2	.000	1.000	9.0	-95.0
18	15.9	.000	1.000		-81.7	24.2	.000	1.000	22.3	-81.7
19	15.9	.000	1.000	6.3	-97.7	24.2	.000	1.000	6.3	-97.7
20	15.9	.000	1.000	9.3	-94.7	24.2	.000	1.000	9.3	-94.7
21	15.9	.000	1.000	6.3	-97.7	24.2	.000	1.000	6.3	-97.7
55	15.9	.000	1.000	8.2	-95.8	24.2	.000	1.000	8.2	-95.8
23	15.9	.000	1.000	6.2	-97.8	24.2	.000	1.000	6.2	-97.8
24	15.9	.000	1.000	7.5	-96.5	24.2	.000	1.000	7.5	-96.5
I=E	LOCK N	UMBER				Line Vive				
FTO	SION=TI	E FIGUR	E(DB) F	IPST I	BLOCKS					
FRA	C=RELA	TIVE NO	ISE CON	TRIBUTI	DN . BLOC	KI				
		IVE NOT					ICKS			
		E FIGUR								
SEN	=SENSI	TIVITYC	DBM) LOI	OKING I	NTO BLD	CK ICS	M=ODE)			

# THIRD ORDER INTERMOD PERFORMANCE MAXIMUM GAIN

#### MINIMUM GAIN

```
PSTOT FRAC
                                                                  P3(I)
                                                                            0
                                       Q
                                                           CUM
BLOCK PSTOT FRAC
                     CUM
                            P3(I)
                                                          0.000
                                                                         -33.6
                                   -54.1
                                           99.0
                                                  0.000
                                                                 -10.5
                           -37.0
    99.0
           0.000
                   0.000
1
                                                                  -12.0
                                   ~55.6
                                           99.0
                                                          0.000
                                                                         -35.1
                                                  0.000
                           -38.5
    99.0
           0.000
                   0.000
                                                  .040
                                                                  -18.0
                                                                         -41.1
                    .000
                           -44.5
                                   -61.6
                                            3.5
                                                           .040
     3.5
            .000
                                                           .040
                                                  0.000
                                                                    6.2
                                                                         -17.2
                    .000
                           -20.5
                                   -41.0
                                            3.5
     3.5
           0.000
                           -29.2
                                   -49.7
                                            3.5
                                                  0.000
                                                           .040
                                                                   -2.5
                                                                         -25.9
     3.5
           0.000
                    .000
                                                                         -31.9
                                             .3
                    .000
                           -35.2
                                                  .043
                                                           .083
                                                                   -8.5
 €,
      .3
            .000
                                   -55.7
                                                                   12.7
                    .000
                           -14.2
                                                           .083
                                                                         -10.8
                                                  0.000
           0.000
                                   -36.5
                                             .3
      .3
      .3
                                                                    9.4
                    .000
                                             .3
                                                           .083
           0.000
                                                                         -14.1
                                                  0.000
 8
                           -17.5
                                   -39.8
            .000
                    .000
                                                  .015
                                                           .098
                                                                         -23.4
                           -26.8
                                   -49.1
 4
     -.4
                                            -.4
                                                                     . 1
                                                                   20.2
                                                  0.000
                                                           .098
                                                                          -3.3
                                   -30.3
                    .000
10
     -.4
           0.000
                            -6.8
                                            -.4
                                                           .098
                           -26.8
                                                  0.000
                                                                     3.
                                                                         -23.3
                    .990
                                   -50.3
                                            -.4
     -.4
11
           0.000
                                                   .000
                                                           .098
                                                                  -26.8
                                   -50.3
                                                                          -50.3
                    .001
                                            -.4
    -4.1
            .000
                           -26.8
12
                                                           .098
                                                                  -13.3
                                                                          -39.5
                                   -39.5
                                            -.4
                                                  0.000
                           -13.3
           0.000
                    .001
13
    -4.1
                                                   .001
                                                           .099
                                                                  -19.3
                                                                          -45.5
            .002
                    .002
                           -19.3
                                   -45.5
                                            -.5
   -10.4
                            -5.8
                                   -36.4
                                                   .033
                                                           .133
                                                                          -36.4
             .037
                    .039
                                           -1.7
                                                                   -5.8
   -22.9
15
            .037
                    .076
                            7.8
                                                                    7.8
                                                                          -25.9
                                   -25.9
                                          -2.7
                                                   .033
                                                           .166
16 -25.8
17 -37.0
            .924
                                                                          -19.7
                   1.000
                            18.0
                                   -19.7 - 10.5
                                                   .834
                                                          1.000
                                                                   18.0
                                                          1.000
                                                                   79.5
                                                                           25.8
           0.000
                   1.000
                            79.5
                                    25.8 -10.5
                                                  0.000
18 -37.0
                            63.5
                                     9.8 - 10.5
                                                                   63.5
                                                                            9.8
19 -37.0
           0.000
                   1.000
                                                  0.000
                                                          1.000
                                                                           19.8
                            77.0
                                    19.8 -10.5
                                                  0.000
                                                          1.000
                                                                   77.0
20 -37.0
           0.000
                   1.000
                                                                   74.0
                                    16.8 -10.5
                                                                           16.8
                                                  0.600
                                                          1.000
           0.000
                   1.000
                            74.0
21 -37.0
                                                                   87.5
                                                                           26.4
                            87.5
                                    26.4 -10.5
                                                  0.000
                                                          1.000
           0.000
                   1.000
22
   -37.0
                                                          1.000
                                                                   85.5
                                    24.4 -10.5
                                                  0.000
                                                                           24.4
                            85.5
23 -37.0
           0.000
                   1.000
                                                          1.000
                            99.0
                                    33.8 -10.5
                                                                   99.0
                                                                           33.8
                                                  0.000
24 -37.0
           0.000
                   1.000
I=BLOCK NUMBER
```

PRIOR NUMBER
PRIOR NUMBER
PRIOR THIRD ORDER INTERCEPT(DBM) FIRST I BLOCKS
FRAC=RELATIVE INTERMOD CONTRIBUTION, BLOCK I
CUM=RELATIVE INTERMOD CONTRIBUTION, FIRST I BLOCKS
PRIOR THIRD ORDER INTERCEPT(DBM) LOOKING INTO BLOCK I
Q=TWO TOME SIGNAL POWER(DBM) INTO BLOCK I SUCH THAT THIRD
ORDER INTERMOD LEVEL EQUALS NOISE POWER LEVEL

# DYNAMIC RANGE COMPUTATION MAXIMUM GAIN

#### MINIMUM GAIN

```
BUDCK 6 DECOM
                                   DITOT
                                                 STOT D(I)
                                                                                 6 DECOM
                                                                                                        DIGT
                                                                                                                    GIGT D(I)
   1
             -1.599.0
                                                -1.5 -46.7 -1.5 99.0
                                    99.0
                                                                                                        99.0
                                                                                                                   -1.5 -19.7
            -6.0 99.0
                                     99.0
                                                -7.5 -48.2 -6.0 99.0
                                                                                                        99.0
                                                                                                                   -7.5 -21.2
   3
            24.0 -14.0 --6.5
                                                16.5 -54.2 24.0 -14.0 -6.5
                                                                                                                    16.5 -27.2
           -8.7 99.0 -6.5
                                                7.8 -30.2 -8.7 99.0 -6.5
          -8.7 99.0 -6.5 7.8 -30.2 -6.0 99.0 -6.5 

-6.0 99.0 -6.5 1.8 -38.9 -6.0 99.0 -6.5 

21.0 -5.0 -6.8 22.8 -44.9 21.0 -5.0 -6.8 

-3.3 99.0 -6.8 19.5 -23.9 -3.3 99.0 -6.8 

-9.3 99.0 -6.8 10.2 -27.2 -9.3 99.0 -6.8 

20.0 8.0 -6.8 30.2 -36.5 20.0 8.0 -6.8
                                                                                                                    7.8 -3.2
                                                                                                                     1.8 -11.9
                                                                                                                   22.8 -17.9
                                                                                                                19.5 3.1
10.2 -.2
   8 -9.3
9
                                                                                          8.0 -6.8
 10 -20.0 99.0 -6.8
                                                                                                                  30.2 -9.5
                                                                                         99.0 -6.8 10.2 10.5
                                                10.2 -16.5 -20.0
 11
            0.0 99.0 -6.8
                                                                                          99.0 -6.8 -16.8 -9.5
-1.5 -6.8 -3.3 -36.5
                                                                         13.5
-6.0
                                                10.2 -36.5
                                                                            -27.0
 12
                       -1.5 -11.7
            13.5
                                                 23.7 -36.5
 13
            -6.0 99.0 -11.7
                                                17.7 -23.0
                                                                           -6.0 99.0 -6.8 -9.3 -23.0
 14
            13.5 -1.5 -19.2 31.2 -29.0

      13.5
      -1.5
      -19.2
      31.2
      -29.0
      13.5
      -1.5
      -6.8

      13.5
      -1.5
      -32.7
      44.7
      -15.5
      13.5
      -1.5
      -6.8

      10.0
      12.0
      -32.7
      54.7
      -2.0
      10.0
      12.0
      -6.8

      20.0
      8.0
      -46.7
      74.7
      8.0
      20.0
      8.0
      -19.7

      -16.0
      99.0
      -46.7
      58.7
      79.5
      -16.0
      99.0
      -19.7

      13.5
      99.0
      -46.7
      72.2
      63.5
      13.5
      99.0
      -19.7

      -3.0
      99.0
      -46.7
      69.2
      77.0
      -3.0
      99.0
      -19.7

      13.5
      99.0
      -46.7
      82.7
      74.0
      13.5
      99.0
      -19.7

      -3.0
      99.0
      -46.7
      82.7
      74.0
      13.5
      99.0
      -19.7

      -3.0
      99.0
      -46.7
      82.7
      74.0
      13.5
      99.0
      -19.7

      -3.0
      99.0
      -46.7
      82.7
      74.0
      13.5
      99.0
      -19.7

      -3.0
      99.0</
                                                                          13.5
                                                                                          -1.5 -6.8
                                                                                                                  4.2 -29.0
15
                                                                                          -1.5 -6.8 17.7 -15.5
16
                                                                                          12.0 -6.8 27.7 -2.0
17
                                                                                                                   47.7
                                                                                                                              8.0
13
       -16.0
                                                                                                                            79.5
                                                                                                                   31.7
19 13.5 99.0 -46.7
                                                                                                                 45.2
                                                                                                                              63.5
20
                                                                                                                  42.2
                                                                                                                              77.0
21
                                                                                                                   55.7
                                                                                                                              74.0
22
            -2.0 99.0 -46.7
                      99.0 -46.7 80.7 87.5 -2.0 99.0 -19.7
99.0 -46.7 94.2 85.5 13.5 99.0 -19.7
                                                                                                                  53.7 87.5
23
            13.5
                                                                                                                 67.2 85.5
24
            -7.5 99.0 -46.7
                                                86.7 99.0
                                                                           -7.5 99.0 -19.7 59.7 99.0
I=BLOCK NUMBER
G=GAIN(DB), BLOCK I
DECOM=1 DB COMPRESSION POINT, BLOCK -
DTDT=1 DB COMPRESSION, FIRST I BLOCKS.
GTOT=TOTAL GAIN, FIRST I BLOCKS
```

D(I) II DB COMPRESSION, LOCKING INTO BLOCK I

M = 1 N = 1 FSC=2768.50 BLOCK= 5 M = 1 N = 1 FSP=2600.00 BLOCK= 5

MyN=DRDER OF SPURS PRODUCED IN THE IF BAND
FSA=FREQUENCY AT WHICH MFS-NFO INTERCEPTS FIL
FSS=FREQUENCY AT WHICH MFS-NFO INTERCEPTS FIL
FSC=FREQUENCY AT WHICH MFO-NFS INTERCEPTS FIL
FSD=FREQUENCY AT WHICH MFO-NFS INTERCEPTS FIL

COMPUTATIONS COMPLETE. DO YOU WISH TO CONTINUE?
TYPE YES OR NO
? NO
DO YOU WISH TO SAVE THIS DATA?
TYPE YES OR NO
? YES
DATA WRITTEN TO TAPE2----PLEASE COPY TO PERM FILE DEVICE AND
CATALOG FOR FUTURE USE
STOP

HALL STOLE OF THE TAIL OF THE STATE OF

1.134 CP SECONDS EXECUTION TIME
COMMAND- CATALOG, TAPE2, TSUIDATA, RP=999
NEWCYCLE CATALOG
INCORRECT PERMISSION
PF ABOPT
COMMAND- CATALOG, TAPE2, SUUDATA, RP=999
INITIAL CATALOG
CT ID= V740334 PFN=SUUDATA:
CT CY= 001 00000320 WGRDS.:

# A.3. RECALL AND EDITING OF A PREVIOUS RECEIVER DATA FILE

This time the old data, saved on the tape, are listed on the printout for receiver no. 5. An additional block is inserted in the signal path after block 18 and the results are printed. Later, block 18 is deleted from the signal path. At this point, it is noticed that the local oscillator frequency (FO) listed for block 2 is in error. One can still change it and print the right results.

3.402 CP SECONDS COMPILATION TIME COMMAND- ATTACH, TAPE1, SJUDATA PF CYCLE NO. = 001 COMMAND- LGO RECEIVER SIGNAL PATH PARAMETERS

INPUT:RECEIVER NUMBER(ANSWER INTEGER 1 TO 56)
? 5
PERFORM NOISE FIGURE COMPUTATIONS? (ANSWER YES OR NO)
?

YES
PERFORM INTERMOD COMPUTATIONS? (ANSWER YES OR NO)
? YES
PERFORM DYNAMIC RANGE COMPUTATIONS? (ANSWER YES OR NO)
? YES
PERFORM SPUR COMPUTATIONS? (ANSWER YES OR NO)
? YES
HAS A FILE BEEN OPENED PREVIOUSLY FOR THE DATA FOR THIS RECEIVER? (ANSWER YES OR NO)
? YES

				• •		
DATA	MAXIMU	GAIN .	MINIMUM	GAIN		
BLOCK	6	F	6	F	P3	BW
1	-1.5	1.5	-1.5	1.5	99.0	2000.000
2	-6.0	6.0	-6.0	6.0	99.0	1000.000
3	24.0	8.0	24.0	8.0	-4.0	2000.000
4	-8.7	8.7	-8.7	8.7	99.0	2000.000
5	-6.0	6.0	-6.0	6.0	99.0	10.000
6	21.0	6.0	21.0	6.0	5.0	2000.000
7	-3.3	3.3	-3.3	3.3	99.0	2000.000
8	-9.3	9.3	-9.3	9.3	99.0	2000.000
9	20.0	8.0	20.0	8.0	18.0	2000.000
10	-20.0	20.0	-20.0	20.0	99.0	2000.000
11	0.0	0.0	-27.0	27.0	99.0	2000.000
12	13.5	6.0	13.5	6.0	8.5	2000.000
13	-6.0	6.0	-6.0	6.0	99.0	2000.000
14	13.5	6.0	13.5	6.0	8.5	2000.000
15	13.5	6.0	13.5	6.0	8.5	2000.000
16	10.0	10.5	10.0	10.5	22.0	2000.000
17	20.0	8.0	20.0	8.0	18.0	2000.000
18	-16.0	16.0	-16.0	16.0	99.0	2000.000
19	13.5	6.0	13.5	6.0	99.0	2000.000
20	-3.0	3.0	-3.0	3.0	99.0	2000.000
21	13.5	6.0	13.5	6.0	99.0	2000.000
55	-2.0	2.0	-2.0	2.0	99.0	2000.000
23	13.5	6.0	13.5	6.0	99.0	2000.000
24	-7.5	7.5	-7.5	7.5	99.0	2000.000
I=BLOCK N	HUMBER					(1) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
G=GAIN(DE						
	IGURE(DB):					
NOTE : F=LO						
P3=THIRD	DRIER INTE	RCEPTS (DBM	) *BLOCK I			

Consect Administration in a State of the Parties of

• •		•				
DATA						
BLDCK	DECOM	FS1	FS2	FD	FII	FIE
<u> </u>	99.0	0.0	0.0	0.0	0.0	0.000
2	99.0	9100.0	10400.0	1300.0	2600.0	3900.000
3	-14.0	0.0	0.0	0.0	0.0	0.000
4	99.0	0.0	0.0	0.0	0.0	0.000
5	99.0	2600.0	2762.5	3006.3	243.8	406.250
6	-5.0	0.0	0.0	0.0	0.0	0.000
7	99.0	0.0	0.0	0.0	0.0	0.000
8	99.0	0.0	0.0	0.0	0.0	0.000
9	8.0	0.0	0.0	0.0	0.0	0.000
10	99.0	0.0	0.0	0.0	0.0	0.000
11	99.0	0.0	0.0	0.0	0.0	0.000
12	-1.5	0.0	0.0	0.0	0.0	0.000
13	99.0	0.0	0.0	0.0	0.0	0.000
14	-1.5	0.0	0.0	0.0	0.0	0.000
15	-1.5	0.0	0.0	0.0	0.0	0.000
16	12.0	0.0	0.0	0.0	0.0	0.000
17	8.0	0.0	0.0	0.6	0.0	0.000
18	99.0	0.0	0.0	0.0	0.0	0.000
19	99.0	0.0	0.0	0.0	0.0	0.000
20	99.0	0.0	0.0	0.0	0.0	0.000
21	99.0	0.0	0.0	0.0	0.0	0.000
23	99.0	0.0	0.0	0.0	0.0	0.000
24	99.0	0.0	0.0	0.0	0.0	0.000
CONTRACTOR OF THE PARTY OF THE	99.0	0.0	0.0	0.0	0.0	0.000
	NUMBER De composico					
FS1=LDWEI	DB COMPRESS:			INFUT FREQU	ENCY	
FS2=UPPE		RE INPUT	FREQUENCY			
	R LIMIT OF A OSCILLATOR		FREQUENCY			
FI1=LOWE					1975/1975/00	
FI2=UPPE			FREQUENCY			
TENDERE!	w CINII OF 1	F INPUT	FREQUENCY			

```
IS DATA CDRPECT? ANSWER YES DR ND

RD
INPUT TYPE OF CHANGE: ADD, CHG, DEL, OP END(TO STOP EDIT)

ADD
INPUT: BLOCK NUMBER
NOTE: FOR ADD ENTER PRECEDING BLOCK NUMBER

18
INPUT DATA COLUMNS(IN OPDER, 12 VALUES)
NOTE: 6TH VALUE IS SENSITIVITY(MIXER ONLY)

-6,6,-6,6,99,2000,99,0,0,0,0
INPUT TYPE OF CHANGE: ADD, CHG, DEL, OR END(TO STOP EDIT)

END
```

A.3.1. Printout After Adding One Block (See 19)

*	Say Colombia	•		. •		
DATA	MAXIMUM	1 GAIN	MIMIMUM	GAIN		
BLOCK	6	F	G	F	Р3	₽W
	-1.5	1.5	-1.5	1.5	99.0	2000.000
1 2	-6.0	6.0	-6.0	6.0	99.0	1000.000
3	24.0	8.0	24.0	8.0	-4.0	2000.000
4	~8.7	8.7	-8.7	8.7	99.0	2000.000
5	-6.0	6.0	-6.0	6.0	99.0	10.000
6	21.0	6.0	21.0	6.0	5.0	2000.000
7	-3.3	3.3	-3.3	3.3	99.0	2000.000
7 8	-9.3	9.3	-9.3	9.3	99.0	2000.000
9	20.0	8.0	20.0	8.0	18.0	2000.000
10	-20.0	20.0	-20.0	20.0	99.0	2000.000
11	0.0	0.0	-27.0	27.0	99.0	2000.000
12	13.5	6.0	13.5	6.0	8.5	2000.000
13	-6.0	6.0	-6.0	6.0	99.0	2000.000
14	13.5	6.0	13.5	5.0	8.5	2000.000
15	13.5	6.0	13.5	6.0	8.5	2000.000
16	10.0	10.5	10.0	10.5	22.0	2000.000
17	20.0	8.0	20.0	8.0	18.0	2000.000
18	-1/5.0	16.0	-16.0	16.0	99.0	2000.000
19	-÷.0	6.0	-6.0	6.0	99.0	2000.000
20	13.5	6.0	13.5	6.0	99.0	2000.000
21	-3.0	3.0	-3.0	3.0	99.0	2000.000
22	13.5	6.0	13.5	6.0	99.0	2000.000
23	-2.0	2.0	-2.0	2.0	99.0	2000.000
24	13.5	6.0	13.5	6.0	99.0	2000.000
25	-7.5	7.5	-7.5 ·	7.5	99.0	2000.000
	NUMBER		AND DESCRIPTION OF THE PERSON			

I=BLOCK NUMBER

G=GAIN(DB) .BLOCK I

F=NDISE FIGURE(DB) .PLOCK I

NOTE:F=LOSS(DB) FOR AN ATTENUATOR
PS=THIRD ORDER INTERCEPTS(DBM).BLOCK I

•						
DATA						
BLOCK	DECOM	F31	FS2	FO	FI1	FI2
1	99.0	0.0	0.0	0.0	0.0	0.000
2	99.0	9100.0	10400.0	1300.0	2600.0	3900.000
3	-14.0	0.0	0.0	0.0	0.0	0.000
4	99.0	0.0	0.0	0.0	0.0	0.000
5	99.0	2600.0	2762.5	3006.3	243.8	406.250
6 7	-5.0	0.0	0.0	0.0	0.0	0.000
7	99.0	0.0	0.0	0.0	0.0	0.000
8	99.0	0.0	0.0	0.0	0.0	0.000
9	8.0	0.0	0.0	0.0	0.0	0.000
10	99.0	0.0	0.0	0.0	0.0	0.000
11	99.0	0.0	0.0	0.0	0.0	0.000
12	-1.5	0.0	0.0	0.0	0.0	0.000
13	99.0	0.0	0.0	0.0	0.0	0.000
14	-1.5	0.0	0.0	0.0	0.0	0.000
15	-1.5	0.0	0.0	0.0	0.0	0.000
16	12.0	0.0	0.0	0.0	0.0	0.000
17	8.0	0.0	0.0	0.0	0.0	0.000
18	99.0	0.0	0.0	0.0	0.0	0.000
19	99.0	0.0	0.0	0.0	0.0	0.000
20	99.0	0.0	0.0	0.0	0.0	0.000
21	99.0	0.0	0.0	0.0	0.0	0.000
22	99.0	0.0	0.0	0.0	0.0	0.000
23	99.0	0.0	0.0	0.0	0.0	0.000
24	99.0	0.0	0.0	0.0	0.0	0.000
25	99.0	0.0	0.0	0.0	0.0	0.000
I=BLOCK	HUMBER					
DECOM=1	DB COMPRESS	SICH POINT	REFER TO	INPUT FREG	UENCY	
FS1=LOW	ER LIMIT OF	RF INPUT	FREQUENCY			
FS2=UPP	ER LIMIT OF	RF INPUT	FREQUENCY			
FO=LOCA	L DSCILLATOR	R FREQUENC	Y			
FI1=LDW	ER LIMIT OF	IF INPUT	FREQUENCY			
FI2=UPP	ER LIMIT OF	IF INPUT	FREQUENCY_	· Constanting of the Constanting		

IS DATA CORPECT? ANSWER YES OR NO ? YES

#### NOISE FIGURE PERFORMANCE MAXIMUM GAIN MINIMUM GAIN PLOCK FTOT FRAC CUM F(I)SEN FTOT FRAC CUM F(I) SEN 1.5 .036 15.9 -88.1 .036 .005 1.5 .005 24.2 -79.8 .108 7.5 .144 -89.6 14.4 7.5 :50. -81.3 .016 22.7 15.5 .763 .907 -95.6 8.4 15.5 .135 -87.3 .114 16.7 .004 22.1 15.5 .910 15.5 -81.9 .001 .136 40.1 -63.9 5 15.6 13.4 -90.6 .013 .923 15.6 .138 31.4 -72.6 .002 15.8 .050 .973 7.4 -96.6 15.8 .008 .145 25.4 -78.6 .974 15.8 .000 15.8 .145 23.0 -81.0 46.3 .000 -57.7 15.8 .002 .976 19.7 -84.3 .000 .146 15.8 43.0 -61.09 .989 15.9 .013 10.4 -93.6 .147 15.9 .002 -70.3 33.7 .991 10 15.9 -77.3 .002 26.7 15.9 .148 53.7 -50.3 .000 .991 11 15.9 0.000 -97.3 19.4 6.7 .182 -70.3 .330 33.7 .007 .998 12 15.9 -97.3 6.7 23.6 .544 -97.3 .874 6.7 .999 13 15.9 .000 -91.8 12.2 23.7 .024 .898 12.2 -91.8 1.000 -97.8 24.2 14 15.9 .001 6.2 .097 .995 -97.8 6.2 -97.5 15 15.9 .000 1.000 6.5 24.2 .004 .999 6.5 -97.5 -93.1 15.9 16 .000 1.000 10.9 .001 24.2 1.000 10.9 -93.1 -92.8 17 15.9 24.2 -92.8 .000 1.000 11.2 .000 1.000 11.2 15.9 18 .000 24.2 -75.7 1.000 28.3 -75.7 .000 1.000 28.3 .000 19 15.9 1.000 12.3 1.000 -91.7 -91.724.2 .000 12.3 15.9 -97.7 20 .000 1.000 6.3 -97.7 24.2 .000 1.000 6.3 .000 21 15.9 1.000 -94.7 9.3 24.2 -94.7 .000 1.000 9.3 .000 22 15.9 1.000 6.3 -97.7 24.2 .000 1.000 6.3 -97.7 .000 1.000 23 15.9 8.2 -95.8 24.2 .000 1.000 8.2 -95.8 -97.8 24 15.9 .000 1.000 6.2 24.2 .000 1.000 6.2 -97.8 1.000 25 15.9 .000 7.5 -96.5 24.2 .000 1.000 7.5 -96.5 I=BLOCK NUMBER FTOT=MOISE FIGURE(DB) FIRST I BLOCKS FRAC=RELATIVE MOISE CONTRIBUTION, BLOCK I CUM=RELATIVE HOUSE CONTRIBUTION, FIRST I BLOCKS F(I)=NOISE FIGURE(DB) LOOKING INTO BLOCK I SEM=SEMSITIVITY(DEM) LOOKING INTO BLOCK I(S/M=0DB)

# THIRD ORDER INTERMOD PERFORMANCE MAXIMUM GAIN

### MINIMUM GAIN

```
BLOCK PSTOT FRAC
                     CUM
                            P3(I)
                                     Q
                                           PSTOT FRAC
                                                          CUM
                                                                 P3(I)
                                                                           0
                                  -54.1
    99.0
           0.000
                   0.000
                                          99.0
                           -37.0
                                                0.000
                                                         0.000
                                                                 -10.5
                                                                        -33.6
    99.6
 2
           0.000
                                  -55.6
                                          99.0
                   0.000
                           -38.5
                                                 0.000
                                                         0.000
                                                                 -12.0
                                                                        -35.1
            .000
 3
      3.5
                                  -61.6
                    .000
                           -44.5
                                           3.5
                                                 .040
                                                          .040
                                                                 -18.0
                                                                        -41.1
     3.5
           0.000
                    .000
                           -20.5
                                  -41.0
                                           3.5
                                                 0.000
                                                          .040
                                                                   6.2
                                                                        -17.2
 5
     3.5
           0.000
                           -29.2
                    .000
                                  -49.7
                                           3.5
                                                 0.000
                                                          .040
                                                                  -2.5
                                                                        -25.9
       .3
            .000
 6
                    .000
                          -35.2
                                            .3
                                                 .043
                                  -55.7
                                                          .083
                                                                  -8.5
                                                                        -31.9
       .3
                                           .3
                    .000
           0.000
                          -14.2
                                  -36.5
                                                 0.000
                                                          .083
                                                                  12.7
                                                                        -10.8
      .3
 8
           0.000
                    .000
                          -17.5
                                  -39.8
                                            .3
                                                 0.000
                                                                   9.4
                                                          .083
                                                                        -14.1
     -.4
            .000
 9
                    .000
                                  -49.1
                                                  .015
                          -26.8
                                           -.4
                                                          .098
                                                                    . 1
                                                                        -23.4
10
     -.4
           0.000
                    .000
                           -6.8
                                  -30.3
                                                          .998
                                           -.4
                                                 0.000
                                                                         -3.3
                                                                 20.2
11
     -.4
           0.000
                    .000
                          -26.8
                                  -50.3
                                           -.4
                                                          .098
                                                 0.000
                                                                  .2
                                                                        -23.3
    -4.1
12
            .000
                    .001
                                  ~50.3
                           -26.8
                                                  .000
                                           -.4
                                                                -26.8
                                                          .098
                                                                        -50.3
13
    -4.1
                           -13.3
           0.000
                    .001
                                  -39.5
                                                 0.000
                                                                -13.3
                                                          .098
                                                                        -39.5
14 -10.4
            .002
                           -19.3
                    .002
                                  -45.5
                                           -.5
                                                  .001
                                                          .099
                                                                -19.3
                                                                        -45.5
15 -22.9
            .037
                    .039
                            -5.8
                                  -36.4
                                          -1.7
                                                  .033
                                                          .133
                                                                 -5.8
                                                                        -36.4
16 -25.8
            .037
                    .076
                            7.8
                                  -25.8
                                                  .033
                                          -2:7
                                                          .166
                                                                  7.8
                                                                        -25.8
17 -37.0
            .924
                   1.000
                            18.9
                                  -18.9 -10.5
                                                  .834
                                                         1.000
                                                                 18.0
                                                                        -18.9
18 -37.0
           0.000
                   1.000
                            85.5
                                   31.8 -10.5
                                                 0.000
                                                        1.000
                                                                 85.5
                                                                         31.8
19 -37.0
           0.000
                  1.000
                           69.5
                                   15.8 -10.5
                                                 0.000
                                                        1.000
                                                                 69.5
                                                                         15.8
20 -37.0
           0.000
                  1.000
                                                        1.000
                            63.5
                                    9.8 -10.5
                                                 0.000
                                                                 63.5
                                                                          9.8
21 -37.0
                           77.0
           0.000
                  1.000
                                                 0.000
                                                        1.000
                                   19.8 -10.5
                                                                 77.0
                                                                         19.8
22 -37.0
           0.000
                           74.0
                  1.000
                                   16.8 -10.5
                                                 0.000
                                                        1.000
                                                                 74.0
                                                                         16.8
23 -37.0
           0.000
                  1.000
                           87.5
                                   26.4 -10.5
                                                 0.000
                                                        1.000
                                                                 87.5
                                                                         26.4
24 -37.0
           0.000
                  1.000
                           85.5
                                   24.4 -10.5
                                                 0.000
                                                        1.000
                                                                 85.5
                                                                         24.4
25 -37.0
                                   33.8 -10.5
          0.000
                  1.000
                            99.0
                                                 0.000
                                                        1.000
                                                                 99.0
                                                                         33.8
I=BLOCK NUMPER
```

PSTOT=THIRD ORDER INTERCEPT(DBM), FIRST I BLOCKS
FRAC=RELATIVE INTERMOD CONTRIBUTION, BLOCK I
CUM=RELATIVE INTERMOD CONTRIBUTION, FIRST I BLOCKS
PS(I)=THIRD ORDER INTERCEPT(DBM) LOOKING INTO BLOCK I
0=TWO TOME SIGNAL POWER(DBM) INTO BLOCK I SUCH THAT THIRD
ORDER INTERMOD LEVEL EQUALS MOISE POWER LEVEL

# DYNAMIC RANGE COMPUTATION MAXIMUM GAIN

### MINIMUM GAIN

```
BLBCK
       6
          DECOM
                  DIDI
                        GTOT D(I)
                                        6 DECOM
                                                    DICT
                                                          GIDT D(I)
1
      -1.5
           99.0
                  99.0
                        -1.5 - 46.7
                                       -1.5
                                             99.0
                                                    99.0
                                                          -1.5 - 19.7
2
      -6.0
           99.0
                  99.0
                        -7.5 -48.2
                                       -6.0
                                             99.0
                                                   99.0
                                                          -7.5 -21.2
                        16.5 -54.2
                                                   -6.5
                                                          16.5 -27.2
 3
      24.0
          -14.0
                  -6.5
                                       24.0 -14.0
                                             99.0
     -8.7
           99.0
                  -6.5
                        7.8 -30.2
                                       -8.7
                                                   -6.5
                                                          7.8 -3.2
           99.0
                                       -6.0
 5
                 -6.5
                         1.8 -38.9
                                             99.0
                                                   -6.5
                                                           1.8 -11.9
     -6.0
           -5.0
                        22.8 -44.9
                                                   -6.8
                                                          22.8 -17.9
                                             -5.0
      21.0
                 -6.8
                                       21.0
           99.0
                                             99.0
                        19.5 -23.9
                                                          19.5
                                                                 3.1
     -3.3
                 -6.8
                                       -3.3
                                                   -6.8
     -9.3
            99.0
                                      -9.3
                                             99.0
                                                   -6.8
                 -6.8
                        10.2 -27.2
                                                          10.2
 8
                                                                -.2
 9
            8.0
                                       20.0
     20.0
                        30.2 -36.5
                                             8.0
                                                   -6.8
                                                          30.2 -9.5
                 -6.8
           99.0
                 -6.8
10
     -20.0
                        10.2 -16.5
                                      -20.0
                                             99.0
                                                   -6.8
                                                         10.2 10.5
                                             99.0
      0.0
           99.0 -6.8
                       10.2 -36.5
                                      -27.0
                                                  -6.8 -16.8 -9.5
11
           -1.5 -11.7
                        23.7 -36.5 13.5
                                             -1.5
                                                  -6.8
      13.5
                                                         -3.3 -36.5
12
                        17.7 -23.0
            99.0 -11.7
                                             99.0 -6.8
      -6.0
                                       -6.0
                                                          -9.3 -23.0
13
                                      13.5
                        31.2 -29.0
                                             -1.5
                                                  -6.8
           -1.5 -19.2
                                                         4.2 -29.0
14
      13.5
                        44.7 -15.5
                                       13.5
                                             -1.5
                                                        17.7 -15.5
15
      13.5
            -1.5 - 32.7
                                                  -6.8
           12.0 -32.7
      10.0
                        54.7
                              -2.0
                                       10.0
                                             12.0
                                                   -6.8
                                                          27.7
                                                                -2.0
16
            8.0 -46.7
                                                          47.7
      20.0
                        74.7
                               8.0
                                       20.0
                                              8.0 -19.7
                                                                8.0
17
                                      -16.0
                                             99.0 -19.7
           99.0 -46.7
                        58.7
                              85.5
                                                          31.7
                                                                85.5
18
     -16.0
                                             99.0 -19.7
                             69.5
                                                          25.7
19
      -6.0
           99.0 -46.7
                        52.7
                                       -6.0
                                                                69.5
                                             99.0 -19.7
20
      13.5
           99.0 -46.7
                        66.2 63.5
                                     13.5
                                                          39.2
                                                                63.5
      -3.0
          99.0 -46.7
                        63.2 77.0
                                      -3.0
                                             99.0 -19.7
                                                          36.2
                                                                77.0
21
                                             99.0 -19.7
           99.0 -46.7
                                    13.5
                                                          49.7
22
      13.5
                        76.7
                             74.0
                                                                74.0
                                             99.0 -19.7
           99.0 -46.7
                             87.5 .-2.0
                                                          47.7
                                                                87.5
23
      -2.0
                        74.7
                                     13.5
                                                          61.2
      13.5
            99.0 -46.7
                        88.2
                             85.5
                                             99.0 -19.7
                                                                85.5
24
            99.0 -46.7
                        80.7
                                       -7.5
      -7.5
                              99.0
                                             99.0 -19.7
25
                                                          53.7
                                                                99.0
I-BLOCK NUMBER
6=GAIN(DB), BLOCK I
DECOM=1 DB COMPRESSION POINT, BLOCK -
DTOT=1 DB COMPRESSION, FIRST I BLOCKS
GTOT=TOTAL GAIN, FIRST I PLOCKS
```

37

D(I) 11 DB COMPRESSION, LOCKING INTO BLOCK I

TIME THE DESIGNATION OF THE PROPERTY OF THE PARTY OF THE

•	•	•	•	•	•	•	•	•	
SPUR	COM	PUTATI	DNS						
M =	1	M =	4	FSB=		9100	0.00	PLBCK=	2
M =	1	И =	5	FSA=		9100	0.00	BLOCK=	2
M =	1	H =	5	FSB=		10400	0.00	BLOCK=	Ξ
M =		H =	6	FSA=		10400	0.00	BLOCK=	2
M = M =	1 1	H =	1	FSC= FSD=		2762 2600		BLOCK= BLOCK=	5

M.N=ORDER OF SPURS PRODUCED IN THE IF BAND FSA=FREQUENCY AT WHICH MFS-NFO INTERCEPTS FI1 FSB=FREQUENCY AT WHICH MFS-NFO INTERCEPTS FI2 FSC=FREQUENCY AT WHICH MFO-NFS INTERCEPTS FI1 FSD=FREQUENCY AT WHICH MFO-NFS INTERCEPTS FI2

COMPUTATIONS COMPLETE. DO YOU WISH TO CONTINUE?

TYPE YES OR NO

YES

DO YOU WISH TO SAVE THIS DATA?

TYPE YES OR NO

NO

DO YOU WISH TO REEDIT CURRENT DATA

TYPE YES OP NO

YES

INPUT TYPE OF CHANGE: ADD, CHG, DEL, OR END(TO STOP EDIT)

INPUT: BLOCK NUMBER

NOTE: FOR ADD ENTER PRECEDING BLOCK NUMBER

18

THERE ARE NOW 24 BLOCKS

INPUT TYPE OF CHANGE: ADD, CHG, DEL, OR END(TO STOP EDIT)

RED

• • DATA		• •				
	MAKIMU	M GAIN	MINIMU	M GAIN		
BLOCK	G	F	6	F	50	
1	-1.5	1.5	-1.5	1.5	P3	BW
2	-6.0	6.0	-6.0	6.0	99.0	2000.000
3	24.0	8.0	24.0	8.0	99.0	1000.000
4	-8.7	8.7	-8.7	8.7	-4.0	2000.000
5	-6.0	6.0	-6.0	6.0	99.0	2000.000
6	21.0	6.0	21.0	6.0	99.0	10.000
7	-3.3	3.3	-3.3	3.3	5.0	2000.000
8	-9.3	9.3	-9.3	9.3	99.0	2000.000
9	20.0	8.0	20.0	8.0	99.0	2000.000
10	-20.0	20.0	-20.0	20.0	18.0	2000.000
11	0.0	0.0	-27.0	27.0	99.0	2000.000
12	13.5	6.0	13.5	6.0	99.0	2000.000
13	-6.0	6.0	-6.0	6.0	8.5	2000.000
14	13.5	6.0	13.5	6.0	99.0	2000.000
15	13.5	6.0	13.5	6.0	8.5	2000.000
16	10.0	10.5	10.0		8.5	2000.000
17	20.0	8.0	20.0	10.5	22.0	2000.000
18	-6.0	6.0	-6.0	8.0	18.0	2000.000
19	13.5	6.0	13.5	6.0	99.0	2000.000
20	-3.0	3.0	-3.0	6.0	99.0	2000.000
21	13.5	6.0	13.5	3.0 6.0	99.0	2000.000
25	-2.0	2.0	-2.0	2.0	99.0	2000.000
23	13.5	6.0	13.5	6.0	99.0	2000.000
24	-7.5	7.5	-7.5	7.5	99.0	2000.000
I=BLOCK NU			-1.0	1.0	99.0	2000.000
G=GAIN(DB)						
F=NOISE FI	GURE (DB) . F	LOCK T		70	1	
NOTE : F=LOS	S(DB) FOR	AN ATTENUA	TOP			
P3=THIRD D	RDER INTER	CEPTS (DBM)	BLOCK I			
			The second secon			

COMPANY THE STATE OF THE STATE

DATA						
BLOCK	DECOM	FS1	FS2	FD	FI1	FIE
1	99.0	0.0	0.0	0.0	0.0	0.000
2	99.0		10400.0	1300.0	2600.0	3900.000
3	-14.0	0.0	0.0	0.0	0.0	0.000
4	99.0	0.0	0.0	0.0	0.0	0.000
5	99.0	2600.0	2762.5	3006.3	243.8	406.250
6	-5.0	0.0	0.0	0.0	0.0	0.000
7	99.0	0.0	0.0	0.0	0.0	0.000
8	99.0	0.0	0.0	0.0	0.0	0.000
9	8.0	0.0	0.0	0.0	0.0	0.000
10	99.0	0.0	0.0	0.0	0.0	0.000
11	99.0	0.0	0.0	0.0	0.0	0.000
12	-1.5	0.0	0.0	0.0	0.0	0.000
13	99.0	0.0	0.0	0.0	0.0	0.000
14	-1.5	0.0	0.0	0.0	0.0	0.000
15	-1.5	0.0	0.0	0.0	0.0	0.000
16	12.0	0.0	0.0	0.0	0.0	0.000
17	8.0	0.0	0.0	0.0	0.0	0.000
18	99.0	0.0	0.0	0.0	0.0	0.000
19	99.0	0.0	0.0	0.0	0.0	0.000
20	99.0	0.0	0.0	0.0	0.0	0.000
21	99.0	0.0	0.0	0.0	0.0	0.000
55	99.0	0.0	0.0	0.0	0.0	0.000
53	99.0	0.0	0.0	0.0	0.0	0.000
24	99.0	0.0	0.0	0.0	6.0	0.000
I=BLOCK NU			U.B. STOLEN			
		ION POINT		INPUT FREQU	DENCY	
FS1=LOWER			REQUENCY			
#S2=UPPER			REQUENCY			
		R FREQUENCY		TEST CONTRACTOR		
FI1=LOWER			PEQUENCY			
FI2=UPPER	LIMIT OF	IF INPUT F	FREQUENCY			

IS DATA CORRECT? ANSWER YES OR NO

? NO
INPUT TYPE OF CHANGE: ADD, CHG, DEL, DR END(TO STOP EDIT)

? CHG
INPUT: BLOCK NUMBER
NGTE: FOR ADD ENTER PRECEDING BLOCK NUMBER

? 2
INPUT DATA COLUMNS(IN ORDER, 12 VALUES)
NOTE: 6TH VALUE IS SENSITIVITY(MIXER ONLY)

? -6,6,-6,6,99,1000,99,9100,10400,13000,2600,3900
INPUT TYPE OF CHANGE: ADD, CHG, DEL, OR END(TO STOP EDIT)

? END

ADTER AND THE LESS AND THE STREET STREET

	F194	1190		Salar Land		
DATA				N. b		
	MAXIMU	M GAIN	MINIMU	M GAIN		
			B	11 - 211211		
BLOCK	6	F	6	1 . F	P3	BW
1	-1.5	1.5	-1.5	1.5	99.0	2000.000
2	-6.0	6.0	-6.0	6.0	99.0	1000.000
3	24.0	8.0	24.0	8.0	-4.0	2000.000
4	-8.7	8.7	-8.7	8.7	99.0	2000.000
5	-6.0	6.0	-61.0	6.0	99.0	10.000
6	21.0	6.0	21.0	6.0	5.0	2000.000
7	-3.3	3.3	-3.3	3.3	99.0	2000.000
8	-9.3	9.3	-9.3	9.3	99.0	2000.000
9	20.0	8.0	20.0	8.0	18.0	2000.000
10	-20.0	20.0	-20.0	20.0	99.0	2000.000
11	0.0	0.0	-27.0	27.0	99.0	2000.000
12	13.5	6.0	13.5	6.0	8.5	2000.000
13	-6.0	6.0	-6.0	6.0	99.0	2000.000
14	13.5	6.0	13.5	6.0	8.5	2000.000
15	13.5	6.0	13.5	6.0	8.5	2000.000
16	10.0	10.5	10.0	10.5	22.0	2000.000
17	20.0	8.0	20.0	8.0	18.0	2000.000
18	-6.0	6.0	-6.0	6.0	99.0	2000.000
19	13.5	6.0	13.5	6.0	99.0	2000.000
50	-3.0	3.0	-3.0	3.0	99.0	2000.000
21	13.5	6.0	13.5	6.0	99.0	2000.000
55	-2.0	2.0	-2.0	2.0	99.0	2000.000
53	13.5	6.0	13.5	6.0	99.0	2000.000
24	-7.5	7.5	-7.5	7.5	99.0	2000.000
I=BLOCK N						TO COLUMNIA DE
G=GAIN(DB			E EVIDAGE E			
	IGURE(DB),				TANK THE	#U - S   3
		AN ATTENU				
F3≔THIRD	DRDER INTE	RCEPTS (DBM	) BLOCK I			

THE RD STREETS OF TEMPORAL WAS U

•				• •		
DATA BLOCK	DECOM	FS1	F32	FO	FI1	FIE
1	99.0	0.0	0.0	0.0	0.0	0.000
ė	99.0	9100.0	10400.0	13000.0	2600.0	3900.000
3	-14.0	0.0	0.0	0.0	0.0	0.000
4	99.0	0.0	0.0	0.0	0.0	0.000
5	99.0	2600.0	2762.5	3006.3	243.8	406.250
6	-5.0	0.0	0.0	0.0	0.0	0.000
7	99.0	0.0	0.0	0.0	0.0	0.000
8	99.0	0.0	0.0	0.0	0.0	0.000
9	8.0	0.0	0.0	0.0	0.0	0.000
1.0	99.0	0.0	0.0	0.0	0.0	0.000
11	99.0	0.0	0.0	0.0	0.0	0.000
12	-1.5	0.0	0.0	0.0	0.0	0.000
13	99.0	0.0	0.0	0.0	0.0	0.000
14	-1.5	0.0	0.0	0.0	0.0	0.000
15	-1.5	0.0	0.0	0.0	0.0	0.000
16	12.0	0.0	0.0	0.0	0.0	0.000
17	8.0	0.0	0.0	0.0	0.0	0.000
18	99.0	0.0	0.0	0.0	0.0	0.000
19	99.0	0.0	0.0	0.0	0.0	0.000
20	99.0	0.0	0.0	0.0	0.0	0.000
21	99.0	0.0	0.0	0.0	0.0	0.060
55	99.0	0.0	0.0	0.0	0.0	0.000
23	99.0	0.0	0.0	0.0	0.0	0.000
24	99.0	0.0	0.0	0.0	0.0	0.000
	K NUMBER				8.33	
DECOM=	1 DB COMPRES WER LIMIT OF	SION POINT RF INPUT	FREQUENCY	INPUT FREQU	ENCY	
FS2=UPI	PER LIMIT OF	RF INPUT	FREQUENCY			
FO=LGC	AL DSCILLATE	R FREQUENC	Y			100,121,121
	WER LIMIT DE		FREQUENCY			
FI2=UPI	PER LIMIT OF	IF INPUT	FREQUENCY			

IS DATA CORRECT? ANSWER YES OR NO ? YES

#### MOISE FIGURE PERFORMANCE MAXIMUM GAIN MINIMUM GAIN BLOCK FTOT FRAC CUM F(I) SEN FTOT FRAC CUM F(I) SEN 1.5 1 . 036 .036 15.9 -88.1 .005 .005 1.5 24.2 -79.8 2 7.5 .108 .144 14.4 -89.6 7.5 .016 .021 22.7 -81.3 3 15.5 .763 .907 8.4 -95.6 .114 .135 15.5 -87.3 16.7 4 15.5 .004 .910 22.1 -81.9 15.5 .001 .136 40.1 -63.9 15.6 5 .013 .923 13.4 -90.6 15.6 .138 .002 31.4 -72.6 6 15.8 .050 7.4 -96.6 .973 15.8 .008 -78.6 .145 25.4 15.8 .000 .974 15.8 -81.0 23.0 .000 .145 46.3 -57.7 15.8 8 .002 .976 19.7 15.8 -84.3 .000 .146 43.0 -61.09 15.9 .013 .989 10.4 -93.6 15.9 .602 .147 33.7 -70.3 10 15.9 .002 .991 -77.3 26.7 15.9 .000 .148 53.7 -50.3 15.9 11 9.000 .991 6.7 -97.3 19.4 .182 .330 33.7 -70.3 12 15.9 .007 .998 6.7 -97.323.6 .544 .874 -97.3 6.7 15.9 13 .000 .999 -91.8 12.2 23.7 .024 .898 12.2 -91.8 14 15.9 .001 1.000 6.2 -97.8 24.2 .097 .995 6.2 -97.8 15 15.9 .000 1.000 6.5 -97.5 24.2 -97.5 .004 6.5 .999 16 15.9 .000 1.000 10.7 -93.3 24.2 -93.3 .001 1.000 10.7 15.9 17 .000 1.000 8.1 -95.9 24.2 .000 1.000 8.1 -95.9 18 15.9 .000 1.000 12.3 -91.7 24.2 .000 1.000 -91.7 12.3 1.000 .000 19 15.9 -97.7 6.3 24.2 .000 1.000 -97.7 6.3 20 15.9 .000 1.000 9.3 -94.7 1.000 24.2 9.3 -94.7 .000 21 15.9 .000 1.000 -97.7 6.3 24.2 -97.7 .006 1.000 6.3 22 15.9 .000 1.000 -95.8 8.2 24.2 1.000 -95.8 .000 8.2 23 15.9 .000 1.000 -97.8 6.2 24.2 .600 1.000 -97.8 6.2 24 15.9 .000 1.000 7.5 -96.5 24.2 .000 1.000 I=BUDCK NUMBER FTOT=NOISE FIGURE(DB) FIRST I BLOCKS FRAC=RELATIVE NOISE CONTRIBUTION, BLOCK I CUM-RELATIVE NOISE CONTRIBUTION, FIRST I BLOCKS F(I)=NDISE FIGURE(DB) LOOKING INTO BLOCK I SEN-SENSITIVITY(DBM) LOOKING INTO BLOCK I(S/M-ODB)

# THIRD DEDER INTERMED PERFORMANCE MAXIMUN GAIN

# MINIMUM GAIN

							HE DOT ! YOU THE		
BEDCK 63	TOT FRAC	CUM CUM	P3(I)						
1 99.0	0.000	0.000	-37.0		1 5		CUM	P3(I)	Q
2 99.0	0.000	0.000	-37.0	-54.1	99.0	0.000	0.000	-10.5	-33.6
3 3.5	.000		-38.5	-55.6	99.0	0.000	0.000	-12.0	
4 3.5		.000	-44.5	-61.6	3.5	.040	.040	-18.0	-35.1
	0.000	.000	-20.5	-41.0	3.5	0.000	.040		-41.1
	0.000	.000	-29.2	-49.7	3.5	0.000		6.2	-17.2
6 .3	.000	.000	-35.2	-55.7	.3		.040	-2.5	-25.9
7 .3	0.000	.000	-14.2	-36.5		.043	.083	-8.5	-31.9
8 .3	0.000	.000	-17.5	-39.8	.3	0.000	.083	12.7	-10.8
94	.000	.000	-26.8		.3	0.000	.083	9.4	-14.1
104	0.000	.000		-49.1	4	.015	.098	.1	-23,4
114	0.000		-6.6	-30.3	4	3.000	.098	20.2	-3.3
12 -4.1		.000	-26.8	-50.3	4	0.000	.098		
	.000	.001	-26.8	-50.3	4	.000	.098	2.	-23.3
	0.000	.001	-13.3	-39.5	4	0.000		-26.8	-50.3
14 -10.4	.002	.002	-19.3	-45.5	5		.098	-13.3	<i>,</i> −39.5
15 -22.9	.037	.039	-5.8	-36.4	-1.7	.001	.099	-19.3	-45.5
16 -25.8	.037	.076	7.8	-25.9		033	:133	-5.8	-36.4
17 -37.0	.924	1.000	18.0		-2.7	.033	.166	7.8	-25.9
18 -37.0	0.000	1.000	69.5	-20.0	-10.5	.834	1.000	18.0	-20.0
19 -37.0	0.000	1.000		15.8	-10.5	0.020	1.000	69.5	15.8
20 -37.0	9.000		63.5	9.8	-10.5	0.000	1.000	63.5	9.8
21 -37.0		1.000	77.0	19.8	-10.5	0.000	1.000		
THE RESERVE AND ADDRESS OF THE PARTY OF THE	0.000	1.000	74.0	16.8	-10.5	0.000	1.000	77.0	19.8
	0.000	1.000	87.5	26.4	-10 5	0.000		74.0	16.8
23 -37.0	0.000	1.000	85.5	24.4	-10.5		1.000	87.5	26.4
24 -37.0	0.000	1.000	99.0	22 6	10.0	0.000	1.000	85.5	24.4
I=PLOCK NO	UMBER	PU PIVNERAL		33.8		0.000	1.000	99.0	33.8
PSTOT=THIE	ED OPDER	INTERC	EDTABLE						
FRAC=RELAT	TIVE INT	EPMED C	EL LITER	2 MAINS	T I BLO	CKS			
CUM=PELAT:	ON DEPARE	TAILED LU	MIPIPUT	IONOFIE	PST I B	LOCKS			199145
P3(I)=THIR O=TWO TONE			EL CUSA	> LOOK:	NG THE	D SLOCK	19 1/20 (2)	12:130 Bb	
ALIMO IDIJE	SIGNAL	POWERO	DEM'S THE	TD TO ME		T. P. PAP. L.	4		

(I)=THIRD ORDER INTERCEPT(DRM) LOOKING INTO BLOCK I IWO TONE SIGNAL POWER(DRM) INTO PLOCK I SUCH THAT THIRD ORDER INTERMOD LEVEL EQUALS HOISE POWER LEVEL

DYNAMIC RANGE COMPUTATION

6 DECOM DTOT BLOCK GTOT D(I) G DECOM DIDT GTOT D(I) 99.0 -1.599.0 -1.5 - 46.799.0 1 -1.5 99.0 -1.5 - 19.7-6.099.0 99.0 -7.5 -48.2 -6.099.0 99.0 -7.5 -81.8 -14.0 24.0 -6.5 16.5 -54.2 24.0 -14.0 -6.516.5 -27.2 99.0 -6.5 -8.7 -8.77.8:-30.2 99.0 -6.57.8 -3.2 -6.0 99.0 -6.5 1.8 -38.9 99.0 -6.0 -6.5 1.8 -11.9 21.0 ~5.0 -5.022.8 -44.9 21.0 -6.8 22.8 -17.9 -6.8 99.0 99.0 -3.3 -6.8 19.5 -23.9 19.5 3.1 -3.3-6.8-9.3 99.0 10.2 -27.2 99.0 -6.8 10.2 -6.8 -9.3 -.2 30.2 -36.5 20.0 -6.8 20.0 -9.5 8.0 3.9 -6.8 30.2 10.2 -16.5 99.0 -6.8 -20.0 99.0 -6.8 19 -20.0 10.2 10.5 11 0.0 99.0 -6.8 10.2 -36.5 -27.0 99.0 -6.8 -16.8 -9.5 13.5 -1.5 -6.8 -6.0 99.0 -6.8 23.7 -36.5 12 13.5 -1.5 - 11.7-3.3 -36.5 17.7 -23.0 13 -6.099.0 -11.7 -9.3 -23.0 -1.5 -19.2 14 13.5 31.2 -29.0 13.5 -1.5 -6.84.2 -29.0 15 13.5 -1.5 - 32.744.7 -15.5 13.5 -1.5 -6.8 17.7 -15.5

10.0

20.0

79.2 77.0 -3.0 99.0 -19.7

CAR THE THE STREET STREET STREET

74.0 13.5 99.0 -19.7

87.5 -2.0 99.0 -19.7

54.7 -2.0

8.0

99.0 -46.7 82.2 63.5 13.5 99.0 -19.7

85.5

99.0

74.7

92.7

90.7

96.7

MINIMUM GAIN

12.0 -6.8 27.7

CARL TURBULE HIS PARKET

8.0 -19.7

68.7 69.5 -6.0 99.0 -19.7 41.7 69.5

13.5 99.0 -19.7

-7.5 99.0 -19.7

-2.0

8.0

74.0

87.5

85.5

99.0

47.7

65.7

63.7

69.7

77.2

55.2 63.5

52.2 77.0

MAXIMUM GAIN

24 -7.5 99.0 -46.7 I=BLDCK NUMBER

10.0

20.0

-6.0

13.5

-3.0

13.5

-2.0

13.5

16

17

18

19

20

21

22

23

G=GRIN(DB), BLOCK I

DECOM=1 DB COMPRESSION POINT, BLOCK DTOT=1 DB COMPRESSION, FIRST I BLOCKS

99.0 -46.7 104.2

12.0 -32.7

8.0 -46.7

99.0 -46.7

99.0 -46.7

99.0 -46.7

99.0 -46.7

STOT=TOTAL GAIN. FIRST I BLOCKS

D(I)31 DB COMPRESSION, LOOKING INTO BLOCK I

•	•		٠	•	•	•	•	•	•	
SPUP	COMPL	JTF	aT I	DNS						
M =	1	14	=	1	FSC=		1040	0.00	BLOCK=	2
M =	1	H	=	1	FSD=			0.00	BLOCK=	2
M =	3	M	_	2	FSA=		953	3.33	BLOCK*	2
M =	3	М	=	2	FSB=		996	5.67	PLOCK=	2
M =	4		=	3	FSA=			0.00	BLOCK=	2
M =	4	14	=	3	FSC=		910	0.00	BLOCK=	5
M =	5	N	=	4	FSC=		988	0.00	BLOCK=	2
M =	5	H	=	4	FSD=		962	0.00	BLOCK=	5
M =	6		=	4	FSA=		910	0.00	BLOCK=	2
M =	6		=	4	FSB=		931	6.67	BLDCK=	2
M =	6	H	=	5	FSC=		1040	9.00	BLOCK=	2
M =	6	H	=	5	FSD=		1018	3.33	BLDCK=	5
M =	1	N	=	1	FSC=		276	2.50	BLOCK=	5
M =	1	N	=	1	FSD=		260	0.00	BLOCK=	5

M,N=ORDER OF SPURS PRODUCED IN THE IF BAND FSA=FREQUENCY AT WHICH MFS-NFO INTERCEPTS FII FSB=FREQUENCY AT WHICH MFS-NFO INTERCEPTS FII FSC=FREQUENCY AT WHICH MFO-NFS INTERCEPTS FII FSD=FREQUENCY AT WHICH MFO-NFS INTERCEPTS FII

COMPUTATIONS COMPLETE. DO YOU WISH TO CONTINUE?
TYPE YES OR NO
? YES
DO YOU WISH TO SAVE THIS DATA?
TYPE YES OR NO
? NO
DO YOU WISH TO REEDIT CURRENT DATA
TYPE YES OR NO
? NO
INPUT:RECEIVER NUMBER(ANSWER INTEGER 1 TO 50)
? A

USER ABORT COMMAND- LOGOUT,,,,

# A.4. EFFECTS OF CHANNEL FOLDING ON RECEIVER PERFORMANCE

Here a receiver with the same signal path characteristics as receiver number 5 is used to demonstrate the effects of folding identical parallel channels into a single output on receiver performance. To simulate a receiver with two identical signal paths up to and including block 7, the user simply re-edits the input data by inserting a block after block 7. All input data columns for this fold block are zeros except column 12. An integer value indicating the number of parallel channels to be folded is typed in this column. The signal path is unchanged from block 8 through 24 (refer to figure 1). Note that the most significant changes are in the computed receiver noise figure and sensitivity performance.

# RECEIVER SIGNAL PATH PARAMETERS

UA I A						
	MAXIM	UM GAIN	MINIM	IIM OATH		
PLOCK	G		MINIM	UM GAIN		
1	-1.5	F	G	F	Р3	BW
2	-6.0	6.0	-1.5	1.5	99.0	
3	24.0	8.0	-6.0	6.0	99.0	1000.000
4	-8.7	8.7	24.0	8.0	-4.0	2000.000
5	-6.0	6.0	-8.7	8.7	99.0	2000.000
6	21.0	6.0	-6.0	6.0	99.0	10.000
7	-3.3	3.3	21.0	6.0	5.0	2000.000
8	-9.3	9.3	-3.3	3.3	99.0	2000.000
9	20.0	8.0	-9.3	9.3	99.0	2000,000
10	-20.0	20.0	20.0	8.0	18.0	2000.000
11	0.0	0.0	-20.0	20.0	99.0	5000.000
12	13.5	6.0	-27.0	27.0	99.0	2000.000
13	-6.0	6.0	13.5	6.0	8.5	2000.000
14	13.5	6.0	-6.0	6.0	99.0	2000.000
15	13.5	6.0	13.5	6.0	8.5	2000.000
16	10.0	10.5	10.0	6.0	3.5	2000.000
17	20.0	8.0	20.0	10.5	22.0	2700.000
18	-16.0	16.0	-16.0	8.0	18.0	2000.000
19	13.5	6.0	13.5	16.0	99.0	2000.000
20	-3.0	3.0	-3.0	6.0	99.0	2000.000
21	13.5	6.0	13.5	3.0	99.0	2000.000
22 23	-2.0	2.0	-2.0	6.0	99.0	2000.000
24	13.5	6.0	13.5	2.0	99.0	2000.000
	-7.5	7.5	-7.5	6.0	99.0	2000.000
I=BLOCK	NUMBER			7.5	99.0	2000.000
E-NOICE I	),BLOCK I			Bestler Cal		
NOTE - E - L	IGURE (DB) , BI	FOCK I				
THE RESERVE	INTINI END A	A 41 A 70 mm	TOR			
. O-ININD	ORDER INTERC	CEFTS (DBM)	.BLOCK I			
			DE 1 3 40 174		BVV at 7	
		Tarrens A				
				Ph. Charles Mary		

TON AS DOWN REWRITE . CONSUMER TONGE THE PARTIES THE TREE THE

SCA ATAC BUT HES WINDSCORES CANSAGING SERVICES A SAN

* ;	*	* *	* *		* * *		
DATA					0,0,0,0,0		
ELOCK		DECOM	FSI	FS2	FO	FII	FI2
1		99.0	-0.0	-0.0	-0.0	-0.0	-0.000
2		99.0	9100.0	10400.0	13000.0	2600.0	3900.000
3		-14.0	0.0	0.0	0.0	0.0	0.000
4		99.0	0.0	0.0	0.0	0.0	0.000
5		99.0	2600.0	2762.5	3006.3	243.9	406.250
6		-5.0	-0.0	-0.0	-0.0	-0.0	-0.000
7		99.0	-0.0	-0.0	-0.0	-0.0	-0.000
8		99.0	0.0	0.0	0.0	0.0	0.000
9		8.0	-0.0	-0.0	-0.0	-0.0	-0.000
10		99.0	-0.0	-0.0	-0.0	-0.0	-0.000
11		99.0	-0.0	-0.0	-0.0	-0.0	-0.000
12		-1.5	-0.0	-0.0	-0.0	-0.0	-0.000
13		99.0	-0.0	-0.0	-0.0	-0.0	-0.000
14		-1.5	-0.0	-0.0	-0.0	-0.0	-0.000
15		-1.5	-0.0	-0.0	-0.0	-0.0	-0.000
16		12.0	-0.0	-0.0	-0.0	-0.0	-0.000
17		8.0	-0.0	-0.0	-0.0	-0.0	-0.000
18		99.0	0.0	0.0	0.0	0.0	0.000
19		99.0	-0.0	-0.0	-0.0	-0.0	-0.000
20		99.0	0.0	0.0	0.0	0.0	0.000
21		99.0	-0.0	-0.0	-0.0	-0.0	-0.000
22		99.0	0.0	0.0	0.0	0.0	0.000
23		99.0	-0.0	-0.0	-0.0	-0.0	-0.000
24		99.0	0.0	0.0	0.0	0.0	0.000
I=BLOCK	N	UMBER	- NaBrooks	0.03	INDUT EDEAL	ICHON	- 51

I=BLOCK NUMBER
DECOM=1 DB COMPRESSION POINT REFER TO INPUT FREQUENCY
FS1=LOWER LIMIT OF RF INPUT FREQUENCY
FS2=UPPER LIMIT OF RF INPUT FREQUENCY
FO=LOCAL OSCILLATOR FREQUENCY
FI1=LOWER LIMIT OF IF INPUT FREQUENCY
FI2=UPPER LIMIT OF IF INPUT FREQUENCY

T YOUR, COOSEAUNIC SELOVER ROTAUMETTA WE ROTE ORGENIES TEST ON

FINIDUR, (BERNSTERERERERERE) BYTHE

DO YOU WISH TO REEDIT CURRENT DATA
TYPE YES OR NO

?
INPUT TYPE OF CHANGE: ADD, CHG, DEL, OR END(TO STOP EDIT)

?
A
INPUT: BLOCK NUMBER
NOTE: FOR ADD ENTER PRECEDING BLOCK NUMBER

?
INPUT DATA COLUMNS(IN ORDER, 12 VALUES)
NOTE: 6TH VALUE IS SENSITIVITY(MIXER ONLY)

?
O,O,O,O,O,O,O,O,O,O,O
INPUT TYPE OF CHANGE: ADD, CHG, DEL, OR END(TO STOP EDIT)

?
E

* DATA	*	*	*	*	*	*	*	*	*		
		MAX	IMUM	GAIN		MTAL	T MIIM	GAIN			
						14.7 (A.	ניוטויו ז	GAIN			
BLOCK		G		F		G					
E E		-1.5		1.5		-1.5		F		P3	BW
2		-6.0		6.0		-6.0		1.5		99.0	2000.000
3		24.0		8.0		24.0		6.0		99.0	1000.000
4		-8.7		8.7		-8.7		8.0		-4.0	2000.000
5		-6.0		6.0				8.7		99.0	2000.000
6		21.0		6.0		-6.0		6.0		99.0	10.000
7		-3.3		3.3		21.0		6.0		5.0	2000.000
8		0.0		0.0		-3.3		3.3		99.0	2000.000
9		-9.3		9.3		0.0		0.0		99.0	2000.000
10		20.0				-9.3		9.3		99.0	2000.000
11		-20.0		8.0		20.0		8.0		18.0	2000.000
12		0.0		20.0		-20.0		20.0		99.0	2000.000
13		13.5		0.0		-27.0		27.0		99.0	2000.000
14		-6.0		6.0		13.5		6.0		8.5	2000.000
15		13.5		6.0		-6.0		6.0		99.0	2000.000
16		13.5		6.0		13.5		6.0		8.5	2000.000
17				6.0		13.5		6.0		8.5	2000.000
ig		10.0	100.55	10.5		10.0		10.5		22.0	2000.000
19		20.0		8.0		20.0		8.0		18.0	2000.000
20		-16.0		16.0		-16.0		16.0		99.0	2000.000
21		13.5		6.0		13.5		6.0		99.0	2000.000
22		-3.0		3.0		-3.0		3.0		99.0	2000.000
23		13.5		6.0		13.5		6.0		99.0	2000.000
24		-2.0		2.0		-2.0		2.0		99.0	2000.000
		13.5		6.0		13.5		6.0		99.0	2000.000
25		-7.5		7.5		-7.5		7.5		99.0	
I=BLOCK	NUN	MBER								33.0	2000.000
G=GAINCI	OB),	BLOCK	I								
F=NOISE	FIG	SURE (DB)	,BLO	CK I							
MOTESEE	.055	(DB) Fr	DR AN	ATTE	AUN'	TOR					
P3=THIRE	OF	DER IN	TERCE	PTS (DE	SM)	BLOCK T					
				AWS IS							

*	*	* *	*	* *	* *	*	
DATA							
BLOCK		DECOM	FSI	FS2	FO	FII	FI2
1		99.0	-0.0	-0.0	-0.0	-0.0	-0.000
2		99.0	9100.0	10400.0	13000.0	2600.0	3900.000
3		-14.0	0.0	0.0	0.0	0.0	0.000
4		99.0	0.0	0.0	0.0	0.0	0.000
5		99.0	2600.0	2762.5	3006.3	243.8	406.250
6		-5.0	-0.0	-0.0	-0.0	-0.0	-0.000
7		99.0	-0.0	-0.0	-0.0	-0.0	-0.000
8 9		99,0	0.0	0.0	0.0	0.0	2.000
		99.0	0.0	0.0	0.0	0.0	0.000
10		8.0	-0.0	-0.0	-0.0	-0.0	-0.000
- 11		99.0	-0.0	-0.0	-0.0	-0.0	-0.000
12		99.0	-0.0	-0.0	-0.0	-0.0	-0.000
13		-1.5	-0.0	-0.0	-0.0	-0.0	-0.000
14		99.0	-0.0	-0.0	-0.0	-0.0	-0.000
15		-1.5	-0.0	-0.0	-0.0	-0.0	-0.000
16		-1.5	-0.0	-0.0	-0.0	-0.0	-0.000
17		12.0	-0.0	-0.0	-0.0	-0.0	-0.000
18		8.0	-0.0	-0.0	-0.0	-0.0	-0.000
19		99.0	0.0	0.0	0.0	0.0	0.000
20		99.0	-0.0	-0.0	-0.0	-0.0	-0.000
21		99.0	0.0	0.0	0.0	0.0	0.000
22	1980	99.0	-0.0	-0.0	-0.0	-0.0	-0.000
23	1975	99.0	0.0	0.0	0.0	0.0	0.000
24	232	99.0	-0.0	-0.0	-0.0	-0.0	-0.000
25		99.0	0.0	0.0	0.0	0.0	0.000
I=BLOC		MBER					
DECOM=	I DB	COMPRES	SION POIN	IT REFER TO	INPUT FRE	QUENCY	
		LIMIT OF	RF INPUT	FREQUENCY	STORY OF THE OWN		
FS2=UP							
		SCILLATO	R FREQUEN				
FII=LO		LIMIT OF	IF INPUT	FREQUENCY			
FI2=UP	PER	LIMIT OF	IF INPUT	FREQUENCY	A STATE OF THE STA	THE EAST OF THE PARTY.	

IS DATA CORRECT? ANSWER YES OR NO

NOISE FIGURE PERFORMANCE MAXIMUM GAIN MINIMUM GAIN SEN FTOT CUM F(1) SEN BLOCK FTOT FRAC CUM F(I) FRAC -79.2 .037 .009 24.8 1.5 .037 18.9 -85.1 1.5 .009 .109 .146 7.5 .028 23.3 .037 -80.7 7.5 17.4 -36.6 .199 .236 -92.6 17.3 -86.7 3 15.5 .919 11.4 15.5 -79.5 .237 40.1 -63.9 24.5 15.5 15.5 .004 .923 .001 -72.6 15.6 -88.2 15.6 .240 31.4 .935 15.8 .003 .013 15.8 15.8 .986 -94.2 .013 .254 25.4 -78.6 6 .051 9.8 23.0 -81.0 15.8 .254 -57.7 15.8 .000 .987 .000 46.3 0.000 18.8 8 18.8 .987 19.7 -84.3 0.000 .254 43.0 -61.0 .000 .254 .001 43.0 9 18.8 .988 19.7 -34.3 18.8 -61.0 .002 -93.6 10 18.9 .007 .994 10.4 18.9 33.7 -70.3 .000 .256 .001 18.9 18.9 .995 26.7 -77.3 53.7 -50.3 11 .995 .159 -70.3 0.000 .415 18.9 33.7 12 6.7 -97.3 21.0 -97.3 .004 -97.3 24.3 . 475 .890 6.7 13 18.9 .999 6.7 12.2 -91.8 -91.8 .999 12.2 24.4 .021 .911 14 18.9 .000 .996 6.2 -97.8 6.2 24.8 18.9 .001 1.000 -97.8 .084 .004 .999 -97.5 24.8 6.5 -97.5 .000 1.000 18.9 6.5 .001 .000 1.000 -93.2 24.8 1.000 10.8 -93.2 17 18.9 10.8 1.000 -95.0 .000 9.0 -95.0 9.0 18 18.9 .000 1.000 24.8 .000 .000 22.3 1.000 22.3 -31.7 19 18.9 1.000 -81.7 24.8 1.000 -97.7 .000 1.000 6.3 -97.7 20 18.9 .000 6.3 24.8 .000 1.000 9.3 24.8 .000 9.3 21 18.9 -94.7 1.000 -94.7 .000 1.000 24.8 .000 1.000 -97.7 22 18.9 6.3 -97.7 6.3 -95.3 23 .000 24.8 .000 1.000 8.2 18.9 1.000 8.2 -95.8 -97.8 24 .000 6.2 -97.8 24.8 .000 1.000 6.2 18.9 1.000 -96.5 7.5 -96.5 24.8 .000 1.000 25 18.9 .000 1.000 I = PLOCK NUMBER FTOT=NOISE FIGURE(DB), FIRST I BLOCKS FRAC=RELATIVE NOISE CONTRIBUTION, BLOCK I CUM=RELATIVE NOISE CONTRIBUTION, FIRST I BLOCKS F(I)=NOISE FIGURE(DB) LOOKING INTO BLOCK I SENESENSITIVITY (DBM) LOOKING INTO BLOCK I (S/N=ODB)

## THIRD ORDER INTERMOD PERFORMANCE MAXIMUN GAIN

### MINIMUM GAIN

```
PLOCK PSTOT FRAC
                    CUM
                          P3(1)
                                  Q
                                        PSTOT FRAC
                                                      CUM
                                                            P3(I)
                                                                     Q
    99.0 0.000
                 0.000
                         -37.0 -53.1 99.0 0.000
                                                   0.000 -10.5
                                                                   -33.4
     99.0
           0.000
                   0.000
                         -38.5
                                 -54.6 99.0 0.000
                                                            -12.0
                                                    0.000
                                                                    -34.9
            .000
                    .000
  3
      3.5
                                 -60.6
                          -44.5
                                        3.5
                                              .040
                                                             -18.0
                                                      .040
                                                                    -40.9
      3.5
                    .000
           0.000
                          -20.5
                                 -40.2
                                        3.5 0.000
                                                       .040
                                                              6.2
                                                                    -17.2
  5
           0.000
                    .000
                          -29.2
                                 -48.9
                                         3.5 0.000
                                                       .040
                                                                    -25.9
                                                              -2.5
  6
      .3
           .000
                    .000
                          -35.2
                                 -54.9
                                          .3
                                              .043
                                                       .083
                                                              -8.5
                                                                    -31.9
  7
      .3
          0.000
                                          .3
                    .000
                         -14.2
                                 -36.5
                                              0.000
                                                       .093
                                                              12.7
                                                                    -10.5
      .3
                                -39.8 .3 0.000
  8
           0.000
                         -17.5
                    .000
                                                       .083
                                                              9.4
                                                                    -14.1
      .3
                                        .3
  9
                    .000
           0.000
                          -17.5
                                -39.8
                                             0.000
                                                                    -14.1
                                                       .083
                                                               9.4
 10
            .000
     -.4
                    .000
                          -26.8
                                -49.1
                                              .015
                                                       .098
                                                                    -23.4
                                        - , 4
                                                              .1
    -.4
 11
          0.000
                    .000
                          -6.8
                                -30.3 -.4
                                              0.000
                                                       .098
                                                              20.2
                                                                    -3.3
     -.4
 12
           0.000
                    .000
                         -26.8
                                 -50.3 -.4
                                              0.000
                                                              .2
                                                                    -23.3
                                                       .098
13
    -4.1
            .000
                         -26.8
                    .001
                                -50.3
                                         -.4
                                              .000
                                                             -26.8
                                                       .098
                                                                    -50.3
    -4.1
           0.000
14
                                         -.4
                   .001
                          -13.3
                                 -39.5
                                              0.000
                                                       .098
                                                             -13.3
                                                                    -39.5
   -10.4
15
            .002
                   .002
                                 -45.5 -.5
                         -19.3
                                               .001
                                                       .099
                                                             -19.3
                                                                    -45.5
   -22.9
            .037
16
                          -5.8
                                               .033
                   .039
                                                              -5.8
                                 -36.4
                                       -1.7
                                                      .133
                                                                    -36.4
   -25.8
            .037
                   .076
                          7.8
                                 -25.9 -2.7
                                              .033
                                                              7.8
                                                      .166
                                                                    -25.9
            .924
18 -37.0
                  1.000
                          18.0
                                 -19.7 -10.5
                                               .834
                                                                    -19.7
                                                     1.000
                                                              18.0
19 -37.0
           0.000
                  1.000
                          79.5
                                 25.8 -10.5
                                              0.000
                                                     1.000
                                                                     25.8
                                                              79.5
20 -37.0
           0.000
                  1.000
                          63.5
                                  9.8 -10.5 0.000
                                                     1.000
                                                              63.5
                                                                     9.8
21 -37 .0
           0.000
                  1.000
                          77.0
                                  19.8 -10.5 0.000
                                                              77.0
                                                                     19.8
                                                     1.000
22 -37.0
           0.000
                  1.000
                          74.0
                                  16.8 -10.5 0.000
                                                     1.000
                                                                     16.8
                                                              74.0
23 -37.0
           0.000
                  1.000
                          87.5
                                 26.4 -10.5
                                             0.000
                                                    1.000
                                                              87.5
                                                                     26.4
24 -37.0
                  1.000
           0.000
                          85.5
                                 24.4 -10,5 0.000 1.000
                                                              85.5
                                                                     24.4
25 -37.0
           0.000
                  1.000
                          99.0
                                  33.8 -10.5 0.000 1.000
                                                             99.0
I = BLOCK NUMBER
PSTOT=THIRD ORDER INTERCEPT(DBM), FIRST I BLOCKS
FRAC=RELATIVE INTERMOD CONTRIBUTION, BLOCK I
CUM=RELATIVE INTERMOD CONTRIBUTION, FIRST I BLOCKS
```

P3(I)=THIRD ORDER INTERCEPT(DEM) LOOKING INTO BLOCK I Q=TWO TONE SIGNAL POWER(DBM) INTO BLOCK I SUCH THAT THIRD ORDER INTERMOD LEVEL EQUALS NOISE POWER LEVEL

DYNAMIC RANGE COMPUTATION
MAXIMUM GAIN

### MINIMUM GAIN

```
BLOCK
         G DECOM
                            GTOT D(I)
                     DTOT
                                               G DECOM
                                                           DTOT
                                                                 GTOT D(I)
 1
       -1.5 99.0
                     99.0
                            -1.5 -46.7
                                             -1.5 99.0
                                                           99.0
                                                                  -1.5 -19.7
  2
        -6.0 99.0
                     99.0
                            -7.5 -48.2
                                              -6.0 99.0
                                                           99.0
                                                                   -7.5 -21.2
  3
       24.0 -14.0
                     -6.5
                            16.5 -54.2
                                             24.0 -14.0
                                                           -6.5
                                                                  16.5 -27.2
        -8.7
               99.0
                      -6.5
                              7.8 -30.2
                                             -8.7
                                                     99.0
                                                            -6.5
                                                                    7.8 -3.2
  5
        -6.0
                      -6.5
               99.0
                             1.8 -38.9
                                              -6.0
                                                     99.0
                                                            -6.5
                                                                    1.8 -11.9
  5
        21.0
               -5.0
                      -6.8
                             22.8 -44.9
                                              21.0
                                                     -5.0
                                                            -6.8
                                                                   22.8 -17.9
  7
        -3.3
               99.0
                             19.5 -23.9
                      -6.8
                                              -3.3
                                                     99.0
                                                            -6.8
                                                                   19.5
                                                                           3.1
  8
         0.0
               99.0
                      -6.8
                             19.5 -27.2
                                              0.0
                                                     99.0
                                                            -6.8
                                                                   19.5
                                                                           -.2
  9
        -9.3
                      -6.8
               99.0
                             10.2 -27.2
                                              -9.3
                                                     99.0
                                                            -6.8
                                                                   10.2
                                                                           -.2
        20.0
 10
               8.0
                             30.2 -36.5
                      -6.8
                                              20.0
                                                     8.0
                                                            -6.8
                                                                   30.2
                                                                          -9.5
       -20.0
               99.0
 11
                     -6.8
                             10.2 -16.5
                                             -20.0
                                                     99.0
                                                            -6.8
                                                                  10.2
                                                                         10.5
         0.0
                    -6.8
 12
                             10.2 -36.5 23.7 -36.5
               99.0
                                             -27.0
                                                     99.0
                                                                 -16.8
                                                            -6.8
                                                                         -9.5
 13
        13.5
               -1.5 -11.7
                                              13.5
                                                     -1.5
                                                            -6.8
                                                                   -3.3 -36.5
 14
        -6.0
              99.0 -11.7
                             17.7 -23.0
                                                     99.0
                                              -6.0
                                                            -6.8
                                                                   -9.3 -23.0
 15
        13.5
               -1.5 -19.2
                             31.2 -29.0
                                              13.5
                                                     -1.5
                                                            -6.8
                                                                    4.2 -29.0
 16
        13.5
               -1.5 -32.7
                             44.7 -15.5
                                              13.5
                                                           -6.8
                                                     -1.5
                                                                   17.7 -15.5
 17
        10.0
              12.0 -32.7
                             54.7
                                   -2.0
                                              10.0
                                                     12.0
                                                           -6.8
                                                                  27.7
                                                                          -2.0
        20.0
 18
                8.0 -46.7
                            74.7
                                   8.0
                                              20.0
                                                     8.0 -19.7
                                                                   47.7
                                                                          8.0
       -16.0
 19
              99.0 -46.7
                             58.7
                                  79.5
                                                    99.0 -19.7
                                             -16.0
                                                                   31.7
                                                                         79.5
 20
        13.5
              99.0 -46.7
                            72.2
                                   63.5
                                              13.5
                                                     99.0 -19.7
                                                                   45.2
                                                                          63.5
 21
        -3.0
              99.0 -46.7
                                   77.0
                             69.2
                                              -3.0
                                                    99.0 -19.7
                                                                   42.2
                                                                         77.0
 22
        13.5
              99.0 -46.7
                             82.7
                                   74.0
                                              13.5
                                                    99.0 -19.7
                                                                  55.7
                                                                         74.0
 23
        -2.0
              99.0 -46.7
                            80.7
                                   87.5
                                              -2.0
                                                    99.0 -19.7
                                                                         87.5
                                                                  53.7
24
        13.5
              99.0 -46.7
                            94.2
                                   85.5
                                              13.5
                                                    99.0 -19.7
                                                                  67.2
                                                                         85.5
25 -7.5 99
I = BLOCK NUMBER
              99.0 -46.7
                            86.7
                                   99.0
                                              47.5
                                                   99.0 -19.7
                                                                  59.7
G=GAIN(DB), BLOCK I
DECOM=1 DB COMPRESSION POINT, BLOCK -
DTOT=1 DB COMPRESSION, FIRST I BLOCKS
GTOT=TOTAL GAIN, FIRST I BLOCKS
D(I) ) DB COMPRESSION, LOOKING INTO BLOCK I
```

									100			
	*	*		*	*	*	*	*	*	*	*	
SE	UR	COMP	IIT (	TT	ONS							
	-				1	FSC =		1040	00.00	DI	OCK =	2
	:			=	1							
M	•	1	N	=		FSD=		910	00.00	BL	.ock=	2
M			M		•	FSA =		051	3.33	RI	OCK=	2
[7]	=	3	LA.	=	2							2
M	=	3	N	=	2	FSB=		996	66.67	BL	.OCK=	Z
M	=	4	N	=	3 3	FSA=		1040	00.00		OCK =	2
M	=	4	N	=	3	FSC =		910	00.00	BL	.OCK=	2
M	=	5	N	=	4	FSC=		988	0.00	BL	OCK =	2
M	=	5	N	=	4	FSD=		962	20.00	BL	OCK=	2
M	=	6	N	=	4	FSA =		910	00.00	BL	OCK =	2
M	=			=	4	FSB=		931	6.67	BL	OCK =	2
	=	6	N			FSC =			00.00		OCK =	2
			14	:	5				33.33		OCK =	2
M	=	6	N	-	7	FSD=		1018	3.33	EL	.UCK =	2
M	=	1	N	:	1	FSC=		276	52.50		OCK=	5
M	=	1	N	:	1	FSD=		260	00.00	BL	OCK =	5

M,N=ORDER OF SPURS PRODUCED IN THE IF BAND FSA=FREQUENCY AT WHICH MFS-NFO INTERCEPTS FI1 FSB=FREQUENCY AT WHICH MFS-NFO INTERCEPTS FI2 FSC=FREQUENCY AT WHICH MFO-NFS INTERCEPTS FI1 FSD=FREQUENCY AT WHICH MFO-NFS INTERCEPTS FI2

```
COMPUTATIONS COMPLETE. DO YOU WISH TO CONTINUE?
TYPE YES OR NO
DO YOU WISH TO SAVE THIS DATA?
TYPE YES OR NO
DATA WRITTEN TO TAPE2 --- PLEASE COPY TO PERM FILE DEVICE AND
CATALOG FOR FUTURE USE
     STOP
      1.525 CP SECONDS EXECUTION TIME
COMMAND- REWIND TAPE 2
COMMAND- REQUEST X, *PF
COMMAND- COPY TAPE2,X
COMMAND- CATALOG X, TSUIDATA, RP=999
 INITIAL CATALOG
 CT ID= V740265 PFN=TSUIDATA
CT CY= 001 00000832 WORDS.:
COMMAND- REWIND TAPE2
COMMAND- BATCH. TAPEZ, PUNCH
TYPE FILE ID- C34 COMMAND- LOGOUT
            9.149
CP TIME
PP TIME
            23.505
                 1 HRS. 13 MIN.
CONNECT TIME
                 7.667
03/27/75 LOGGED OUT AT 10.42.27.
```

# APPENDIX B

### COMPUTATION OF PERFORMANCE PARAMETERS

In this Appendix, all of the equations are listed for computing the receiver performance parameters listed in the tabulated program outputs.

To make the noise figure calculation, first transfer the input,

$$F_{n=10}$$
 (Fn(dB)/10)

$$G_{n=10}$$
 (Gn(dB)/10)

$$FTOT(1) = 10 log F1$$

FTOT(n) = 10 log 
$$(\frac{F_{n-1}}{G_1G_2...G_{n-1}})$$
 (B-1)

$$F_T = F_1 + \frac{F_2^{-1}}{G_1} + \frac{F_3^{-1}}{G_1^{G_2}} + \frac{F_4^{-1}}{G_1^{G_2}G_3} + \dots + \frac{F_n^{-1}}{G_1^{G_2}\dots G_{N-1}}$$

$$FRAC(1) = \frac{F_1}{F_T}$$

$$FRAC(n) = \left(\frac{F_N^{-1}}{G_1 G_2 \dots F_{N-1}}\right) / F_T$$
 (B-2)

$$CUM(n) = FRAC(1) + FRAC(2) + ... + FRAC(n)$$

$$F(I)(1) = 10 \log F_T$$

$$F(I)(2) = 10 \log (F_2 + \frac{F_3^{-1}}{G_2} + \frac{F_4^{-1}}{G_2G_3} - + \dots + \frac{F_N^{-1}}{F_2G_3 \dots G_{n-1}})$$

$$F(I)(3) = 10 \log (F_3 + \frac{F_4^{-1}}{G_3} + \dots + \frac{F_N^{-1}}{G_3^{G_4 \dots G_{n-1}}})$$
 (B-3)

When a fold mode of m branches is typed in, the program will multiply the total noise in the signal path from the input to the fold block by m. Suppose the k+1 block is the fold block, then multiply

$$(F_1 + \frac{F_2^{-1}}{G_1} + \frac{F_3^{-1}}{G_1^{G_2}} + \dots + \frac{F_k^{-1}}{G_1 \dots G_{k-2}})$$

by m for the noise figure calculation and the remainder of the calculations will be carried out as usual.

SEN(n) = -114 + F(I)(n) + 10 log 
$$(\frac{BW(MHz)}{1MHz})$$
 (B-4)

When calculating the third order intermodulation performance and dynamic range, the input is Pn(dB) where

$$P_{10} = \frac{P_{10}(\frac{P_{10}(B)}{10})}{P_{10}}$$

$$P_{3}^{TOT(1)} = 10 \log P_{10}$$

$$P_{3}^{TOT(n)} = 10 \log (\frac{P_{10}(G_{10}^{T}G_{1$$

$$\frac{\frac{1}{P_{T}} = \frac{1}{P_{1}} + \frac{G_{1}}{P_{2}} + \frac{G_{1}G_{2}}{P_{3}} + \dots + \frac{G_{1}G_{2} \cdots G_{N}^{-1}}{P_{N}}$$

$$FRAC(n) = \frac{Pn^{3}}{G_{1}G_{2} \cdots G_{n-1}}$$

$$P_{T}$$
(B-6)

(B-5)

$$CUM(n) = FRAC(1) + FRAC(2) + ... + FRAC(n)$$
(B-7)

$$P_3(I)(1) = 10 \log P_T$$

$$P_3(I)(2) = 10 \log \left( \frac{1}{P_2} + \frac{G_2}{P_3} + \dots + \frac{G_2G_3 \dots G_{N-1}}{P_N} \right)$$

$$P_3(1)(3) = 10 \log \left( \frac{1}{\frac{1}{P_3} + \frac{G_3}{P_4} + \frac{G_3G_4}{P_5} + \dots + \frac{G_3G_4 \dots G_{N-1}}{P_N}} \right)$$
 (B-8)

The power level of two equal amplitude signals which generate the intermod that equals the noise level is defined as

$$Q(n) = \frac{1}{3} SEN(n) + \frac{2}{3} P_3(I)(n)$$
 (B-9)

Note values for SEN, P3(I) and Q of Figure 2 and Block 1 data on the noise figure and intermod performance tables. The 1 dB compression point dynamic range calculations depend on the gain and 1 dB compression point of each stage where  $G_1(dB)$ ,  $G_2(dB)$ , ... $G_n(dB)$  is the gain of each stage and  $GC_1(dB)$ ,  $GC_2(dB)$ , ... $GC_n(dB)$  is the 1 dB compression point of each stage.

 $DTOT(1) = GC_1(dB)$ 

 $DTOT(2) = GC_2(dB)-G_1(dB)$ . Compare DTOT(1) with DTOT(2) and select the smaller value for DTOT(2).

DTOT(3) - 
$$GC_3(dB) - G_2(dB) - G_1(dB)$$
 (B-10)

Compare DTOT(2) with DTOT(3) and call the smaller value DTOT(3).

$$DTOT(n) = GCn(dB)-Gn-1(dB) - ... -G_1(dB)$$
 (B-11)

Compare DTOT(n) with DTOT(n-1) and call the smaller one DTOT(n).

$$GTOT(n) = G_1(dB) + ... + Gn(dB)$$
 (B-12)

D(1) = DTOT(N)

To obtain D(2)

 $D(2) = GC_2(dB)$ 

 $D(3) = GC_3(dB) - G_2(dB)$  compare with D(2) call the small one D(2).

 $D(4) = GC_4(dB) - G_3(dB) - G_2(dB)$  compare with the new D(2) call the smaller one D(2).

$$D(N) = GC_{N}(dB) - G_{N-1}(dB) - G_{N-2}(dB) \dots G_{2}(dB)$$
 (B-13)

To obtain D(3)

 $D(3) = GC_3(dB)$ 

 $D(4) = GC_4(dB)$  compare with D(3) call the smaller one D(3).

 $D(5) = GC_5(dB) - G_3(dB)$  compare with D(3) and call the smaller one D(3).

 $D(N) = GC_N(dB) - G_{N-1}(dB) \dots - G_3(dB)$  compare with D(3) and call the smaller one D(3).

# B.1. Computation of Spurious Responses

In superheterodyne receivers, where a nonlinear element is used to get a desired intermediate frequency signal from the mixing of the incoming signal and a local oscillator (LO) signal, interference from spurious external signals results in a number of undesired frequencies that may fall within the intermediate frequency (IF) band. The standard defining equation 4 for determining the IF frequency is:

FI +MFS +NFO where

FO = local oscillator frequency

FII - lower limit of IF

FI2 = upper limit of IF

FS - signal frequency, FS1 and FS2 are the lower and upper limits of the RF input frequency band. M and N are positive integers representing harmonics of the signal and LO frequencies. When M and N = 1, MFS and NFO are the fundamental frequencies. When mixing for the different frequency in the IF, the equations are:

FI - MFS-NFO for FS greater than FO

FI = NFO-MFS for FS less than FO

To compute the spurious responses in the IF where FI1 and FI2 are the lower and upper limits of the IF band, the following equations are used.

$$FSA = \frac{FI1 + NFO}{M}$$
 (B-14)

$$FSB = \frac{F12 + NFO}{M}$$
 (B-15)

$$FSC = \frac{NFO - FI1}{M}$$
 (B-16)

$$FSD = \frac{NFO - FI2}{M}$$
 (B-17)

The frequency ranges FSA to FSB and FSC to FSD represent the frequency regions in the input which generate spurs. Refer to figure 3 and the spur computations in Appendix A. In rare cases, when IF filtering is not used, the IF output bandwidth may be larger than the input. Under such conditions spurious responses will exist in the IF output which are not detected by equations 14 through 16. The following equations describe where these mixer-generated spurious responses exist in the IF output.

NFO-MFS2 = FSE

NFO-MFS2 = FSF for FO greater than FS

MFS1-NF = FSG

MFS2-NFO = FSH, for FS greater than FO

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SAN ARPAND NO PAR COURAGE EXPLORENZATIONS CONTAINS ARRESTS ASSESSED.

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Topic 1708.782 Fpt. 1701. 01.70

#### APPENDIX C

# COMPUTER PROGRAM LISTING

```
PROSRAM MACAIR (INPUT, OUTPUT, TAPE1, TAPE2)
       DIMENSION ROVO (50,5,10), 6°(50)
    DATA ARRAY ROVD(I, J, K)
        T=BLOCK NUMBER
 C
         J=COLUMN OF DATA
         K=COMPUTATIONS
             K=1 IMPUT CATA
C
                   INFUT CONVERSION
              K=2
              K=3
                  NOISE COMPUTATION (MAX)
              K=4
                   NOISE COMPUTATION (HIN)
                  INTERNOU CONTATUENCE COMPANDATIVE (NIM) NOTITATURED COMPANDATIVE
              K=5
              K=6
              K=7
                    DYNAMIC AND SPUR INPUT DATA
              K=8
                    DYNAMIT RANGE COMPUTATION (MAX)
                    DYNAMID RANGE COMPUTATION (MIN)
              K=9
              K=10 AVAIL43LE
C++++++++
G PROCEDURE
C OUTPUT HEADER
       PRINT 100
      FORMAT (* RECEIVER SIGNAL PATH PARAMETERS*)
      PRIMT 101
       FORMAT (12Y)
      PRINT 101
C IDENTIFY RECEIVER
C
      FOR BATCH PROCESSING RECEIVER NUMBER MUST BE GREATER THAN 50
1 PRINT 102
102 FORMAT(* IMPUTIRECEIVER NUMBER (ANSWER INTEGER 1 TO 50)*/* ?*)
      READ *, NREC
      IF(NREC. ST. 50) GO TO 8
C WHICH COMPUTATIONS TO BE PERFORMED
      NFLAG= 0
      IFLAG=0
      IDFLAG=0
      ISFLAG=0
      PRINT 105
      FORMAT ( PERFORM NOISE FIGURE COMPUTATIONS? (ANSWER YES OR NO) .
      READ 106 ATIS
106
      FORMAT (A1)
      IF (ANS. ED. 147) NFLAG=1
      PRINT 107
107 FORMAT (* PERFORM INTERMOD COMPUTATIONS? (ANSHER YES OR NO) */* ?*;
      READ 106,445
      IF(AMS. EQ. 1HY) IFLAG=1
      PRINT 136
      FORMAT (* PERFORM DYNAMIC RANGE COMPUTATIONS? (ANSWER YES OR NO) .
130
      READ 105,415
      IF (ANS. EQ. 1HY) INFLAGE1
      PRINT 131
      FORMAT (* PERFORM SPIR CONPUTATIONS? (ANSHER YES OR NO) */* ?*)
131
```

```
READ 105,AVS
      IF (ANS. EQ. 1HY) ISFLAG=1
C+++++++++
    WHERE TO OBTAIN DATA
C
C. . . . . . . . .
      PRINT 108
      FORMAT (* HAS A FILE BEEN DENED PREVIOUSLY FOR THE DATA FOR*/
108
         * THIS RECEIVER? (ANSWER YES OR NO) */* ?*)
____1
      READ 105, ANS
      IF(ANS.ER.1HY) GO TO 10
2
      PRINT 109
109 FORMAT (* INPUT INUMBER OF BLOCKS (INTEGER ANSWERS 1 TO 56) # / ?*)
      READ +, NR
  INPUT DATA BLOCKS
C
      00 5 I=1, NR
3 PRINT 110,I
11 FORMAT(* ACCEPTABLE BLOCK TYPES: LINEAR, AMPLIFIER, MIXER, *
1 *FOLD*/* INPUT: TYPE, BLOCK *, 12/* ?*)
      READ 105, AIS
      IF(ANS.ED. 1HL) GO TO 20
       IF (ANS. EQ. 1HA) GO TO 30
     IF (ANS. FO. 1HI) GO TO 40
       IF (ANS. EO. 1HF) 60 TO 45
    PRINT 111
     FORMAT (* UNACCEPTABLE ANSWER*)
  GO TO 3
C LINEAR BLOCK
50
      PRINT 112
       FORMATI IS GAIN FIXED OR VARIABLE?*/* ?*)
112
       READ 105,445
       IF (ANS. LO. 1HF) GO TO 25
       IF (ANS.NE.1HV) GO TO 50
C ....
     VARIABLE LINEAR
       FORMAT (* INPUT MAXIMUM GAIN (BC) PIAR MUMIXAM TUPNI *) TAMEOR
113
       READ *, ROVO(I, 1,1), RCVD(I, 3,1)
       DO € LL=1, 3, 2
       IF(RCV9(I,LL,1).3E.3.)R3V3(I,LL+1,1)=RCV3(I,LL,1)
6
       IF(RCVD(I,LL,1).LT.0.)FGVD(I,LL+1,1)=-RCVD(I,LL,1)
       GO TO 32
C
C
      FIXED LINEAR
      PRINT 114
25
       FORMAT (* INPUT (GAIN(DR) */* ?*)
114
       READ *, RCV7(I, 1, 1)
       RCVD(I,3,1) =RCVD(I,1,1)
       RCVD(I,2,1)=RCVD(I,1,1)
       IF(RGVD(I, 2, 1) .LT.0) ?GVD(I, 2, 1) = -RCVN(I, 2, 1)
       RCVD(I,4,1)=RCVD(I,2,1)
       GO TO 32
" AMPLIFIER
30
       PRINT 115
```

AND A POLICE OF STREET, INCOME TO ADDRESS AND

```
FORMAT( 14PUT:GAIN(On), NOISE FIGURE(OB) */* ?*)
115
      READ *, RCV)(I,1,1), ECVD(I,2,1)
      RCVD(I,3,1)=RCVD(I,1,1)
      RCV0(I,4,1) = RCV0(I,2,1)
31
      PRINT 116
116 FORMAT (* IMPUTITIVERMOD INTERCEPTS (DBN) ITHIRD ORDER*/
      1 * MOTELHRITE 99 FOR UNKNOWN INTERCEPT*/* ?*)
      READ *, RCVD(I,5,1)
32
      IFCIDFLAG. TO. 0160 TO 5
      PRINT 132
      FORHAT (* IMPUT 108 COMPRESSION POINT (REFER TO INPUT LEVEL) */
132
     1 * IF UNKNOWN ENTER 99. */* ?*)
      RE40 *, RCVD(I, 1,7)
GO TO 5
C MIXER
40
      PRINT 117
      FORMAT (* IMPUTAMIXER GAIN (DB) , OUTPUT BANDWINTH (M4Z) +/
     1 * NOTE (GAIN (DB) IS NEGITIVE FOR CONVERSION LOSS*/* ?*)
      READ *, RCVO(I, 1, 1), RCVO(I, 5, 1)
      RCYN(I, 3, 1) = RCVN(I, 1, 1)
      RCVD(I,?,1) = RCVO(I,1,1)
      IF(RCVD(I,1,1).LT.0.)RCVD(I,2,1)=-RCVD(I,1,1)
      RCVD(I, 4, 1) = RCVD(I, 2, 1)
      IF(ISFLAG. ED. 0) GO TO 31
      PRINT 133
     FORMAT(* IMPUT DATA FOR SPUR COMPUTATIONS*/* IMPUT: IMPUT: 1 * FREQUENCY BAND(2 VALUES)*/10x,*LOCAL OSCILLATOR FREQUENCY*
        7,10x, *OHTPUT FPERUENCY BAND(2 VALUES) */, * ENTER 99. FOR *
*UNKNOWN VALUES */* ?*)
      READ *, (RCVD(I,K,7),K=2,6)
      GO TO 31
5
      CONTINUE
      GO TO 51
C
     FOLD
      PRINT +, "I 'IPUT NUMBER OF CHANNEL PATHS"
45
      READ *, RCV7(I, 6,7)
      DO 46 J=1,4
      RCVD(I, J, 1) = 0.
      GO TO 5
      00 55 I=1, VR
      IF (RCVD(I, 3, 1) . 27.0.) RCVO(I, 5, 1) = 99.
      IF(RCVn(I,1,7).E7.0.) RCVn(I,1,7)=99.
55
      IF (RCVn(I, 5, 1) . 20. 0) RGVn(I, 6, 1) = 2000.
C PRINT DATA ARRAY
Careares
16
      PRINT 118
      FORMAT (/3x, 10(1H+, 4x)/+ TATA+/14x, +MAXIMUM GAIN+, 8x,
     1 *MINIMUM GAIN#//* ALOCK+2(9x, *G*, 9x, *F+) 9x+=3*7x+0H+)
      DO 7 I=1,42
      PRINT 119,1, (RCVD(I,J,1), J=1,5)
      FORMAT (13.4X,5F10.1,F10.3)
119
      PRINT 120
      FORMAT (* I=BLOCK MUMPER*/* G=GAIN(DB), BLOCK I*/
120
     1º F=NOISE FIGURE(OR), 3LOCK I*/* NOTE: F=LOSS(OR) FOR AN *
```

```
1 SOTAUNETTA $2
     3 * P3=THIRD ORCER INTERCEPTS(OBM), BLOCK I*///)
      00 54 I=1,'IR
PRINT 119,1,(RCVD(I,J,7),J=1,5)
FORMAT(/3X,10(1H*,4Y),/,* DATA*/* BLOCK*,7X,*DECOM*,6X,*FS1*,
     1 7x,*FS2*,7x,*F0*,8x,*FI1*,7x,*FI2*)
PRINT 140
     FORMAT (* I = BLOCK NUMBER*/
140
     1 * DECOM=1 DB COMPRESSION POINT REFER TO INPUT FREQUENCY*/
     2 * FS1=LONER LIMIT OF PF IMPUT FREQUENCY*/
     3 * FSZ=UPPEP LIMIT OF RE INPUT FREDUENCY*/
     4 * FO=LOCAL OSCILLATOR FREQUENCY*/
     5 * FI1=LOWER LIMIT OF IF INPUT FREQUENCY*/
6 * FI2=UPPTR LIMIT OF IF INPUT FREQUENCY*///)
     IF(NREC. GT. 50) GO TO 200
      PRINT 121
121 FORMAT (* IS DATA CORRECT? ANSWER YES OR 40*/* ?*)
      READ 105, AYS
      IF(ANS. EO. 1HY) GO TO 800
  FOITING OF DATA
    PRINT 124
15
     FORMAT (* IMPUT TYPE OF SHANGE: ADD, CHG, DEL, OR END (TO STOP .
     1 *EDIT) */* ?*)
      READ 106, ANS
      IF(ANS. EO. 1HE) GO TO 51
      PRINT 1241
1241 FORMAT (* INPUT: BLOCK NUMBER*/* NOTE: FOR ADD ENTER PRECEDING"
     1 * BLOCK NUMBER*/* ?*)
      READ *, NS
      IF (ANS. EQ. 1HA) GO TO 60
      IF(ANS.EQ. 14C) GO TO 65
      IF (ANS. EQ. 1HD) GO TO 68
      PRINT 111
      GO TO 15
    INPUT DATA FROM PREVIOUS FILE
C
      NFLAG=IFLAG=IDFLAG=ISFLAG=1
8
      READ (1, 92) NRD, NR
      IF(ENF(1))600,9
      FOPMAT (212)
 92
      CONTINUE
      RFAD(1,91)((RCV7(I,1,1), J=1,5), I=1,NR)
      READ(1,91)((RCVP(I,J,7),J=1,6),I=1,HR)
   FORMAT (5F10.1,F10.3)
       IF(NREC. GT. 50) GO TO 51
      IFINRO. EQ. NRECT 30 TO 15
      PRINT 122, NREG, NRT
122 FORMAT (* RECEIVER IN INPUT *12* DOES NOT MATCH ID IN FILE*12/
1 * INPUT 'ABORT' DR 'CONTINUE'*/* ?*)
      READ 105, ANS
      1F(ANS.EQ.1HC) 60 TO 15
      PRINT 123
      FORMAT(* NEW DATA MUST BE INPUT*)
123
```

```
CO TO 2
  C
  C
       ADD BLOCK
  60
       IF(N".EQ.N?) GO TO 53
       IN?=NR+1
 61
       PO 62 I=1,5
       RCV0(INR,I,7)=RCV0(INR-1,I,7)
       RCVO(INR,I,1)=RCVD(INR-1,I,1)
 62
       INR= INR- 1
       IF(INR.GT.NB) GO TO 61
 63
       NP=NP+1
       NR=NR+1
 C
 C
      CHANGE BLOCK
 65
       PRINT 125
       FORMAT (* IMPUT DATA COLUMNS (IN ORDER, 12 VALUES) */
 125
      1 . NOTE: 614 VALUE IS SENSITIVITY (MIXER ONLY) */* ?*)
       RE 40 +, (RCVD (NB, I, 1), I=1,5), (RCVD (NB, J,7), J=1,5)
 1;
 C
      DELETE BLOCK
 66
       NX=NR-1
       00 69 I=110,11X
       DO 69 J=1,5
      RCV0(I, J,7) =RCV0(I+1, J,7)
 69
      RGVn(I,J,1)=RCVD(I+1,J,1)
       NR=HX
       PRINT 126, TR
      FORMAT (* THERE ARE NOW FIZ* BLOCKS*)
      GO TO 15
C NOISE COMPUTATIONS
 200 CONTINUE
      GP(1)=1.
      00 201 I=1, NR
      00 201 J=1.5
      RCVD(I,J,2)=10.++(R3VD(I,J,1)/10.)
      1F(J.EQ. 1.4ND. ROYD(I, J, 1). EQ. 99.) RGVD(I, J, 2)=1.
      IF(J.E7. 3.440. RCVC(I,J,1). E0. 99.) RCVD(I,J,2)=1.
      IF (J. EG. 2. AMD. RCVD(I, J, 1) . EQ. 39.) RCVD(I, J, 2) = 0.
      IF(J.E7.4.4ND. PCVD(I,J,1).E0.99.) RCVD(I,J,2)=0.
201
      CONTINUE .
      K= T
      00 215 4=1,3,2
      N=4+1
      DO 202 I=2, MR
      GP (I) = GP (I-1) *RGV (I-1, 4,2)
202.
C
C ....
     FT COMPUTATION
     FT=RCV0(1,2,2)
      00 207 I=2. NR
     IF(RCVD(I, 7, 7).ED.0..AND. RCVD(I, 6, 7).NE.0.)FT=RCVD(I, 6, 7) *FT
FT=(RCVD(I, N, 2)-1.)/GP(I)+FT
203
G FTOT FPAC COMPUTATION
     RCVD(1,1,K)=RCVD(1,N,2)
```

```
RCVD(1,2,K) = RCVD(1,1,K)/FT
      00 204 I=2,NR
      RCVD(I,1,K) = (RCVD(I,N,2)-1.)/GP(I)
      PCVD(I,2,K) =RCVD(I,1,K)/FT
      IF (PCVD(1,2,7).50.0.. AND. ROVD(1,6,7).NE.0.160 TO 207
      RCVD(I,1,K)=RCVD(I,1,K)+RCVD(I-1,1,K)
      60 TO 204
      RGVD(I,1,K)=RGVD(I,6,7)*RCVD(I-1,1,K)
207
      DO 209 NH=1.I
      RCVD(NN, 2,K) = RGVD(I, 6,7) + RGVD(NN, 2,K)
209
      CONTINUE
204
   SUMMATION OF FRAC
C
      RCVD(1,3,K)=RCVD(1,2,K)
      DO 205 I=2, NR
     'RGVn(I,3,K)=RCVD(I-1,3,K)+RCVD(I,2,K)
      1=N2-1
      FOLD=FFOLD=1.
      RCVD(NR, 4, K) = RCVD(N2, N, 2)
IF(I.EQ.0)50 TO 210
205
      RCVD(I,4,K) = (RCVD(I+1,4,K)-FFOLD)/RCVD(I,M,2)+RCVD(I,N,2)
     1 FOLD
      IF(RCVD(I,2,7).E1.G..AND.RCVD(I,6,7).NE.J.)FOLD=FOLD*RCVD(I,6,7)
      IF(RCVD(I+1,2,7).EQ. 0..AND. RCVD(I+1,6,7).NE. 0.) FFOLD=FFOLD*RCVD(I+
     11,6,7)
I=I-1
      GO TO 206
      CONTINUE
 210
    CONVERSION TO REAL NUT
C
      DO 211 I=1,NR
      IF(RCVN(I, J, K) . E7. 0. ) GO TO 211
      RCVD(I, J,K) =10. ALOG10 (RCVD(I, J,K))
      CONTINUE
 211
     SENSITIVITY
 C
       RCVD(1,6,2) = RCVD(1,5,1)
       DO 70 I=2,4R
       RCVD(1,5,2) = AHI'11 (RCVD(1,5,1),RCVD(1,6,2))
70
       X94=10. * ALOGIO (RCVD(1, 6, 2))
       DO 212 I=1, NR
      RCVD(I,5,K) =-114. +3CVD(I,4,K) +XNH
 212
       K=K+1
 215
       CONTINUE
    PRINT NOISE FIGURES
 C
       IF(NFLAG.EQ. 0) 60 TO 250
       PRINT 208
 208
       FORMAT (/3X, 16 (1H*, 4Y) /)
       PRINT 213
       FORMATION HOISE FIGURE PERFORMANCE 1/20X, THAXIMUM GAIN 20X
 213
       *MINIMUM GAIN*//* BLOCK *, 2(*FTOT FRAC GUM F(I)*
      2 3X, "SEN
       00 214 I=1, NR
       PRINT 216, I, (RCVT(I, J, T), J=1, 5), (RCVD(I, K, 4), K=1, 5)
       FORMAT (13, 2(F6.1, 2F7. 3, 2F7.1))
  216
```

```
214
      CONTINUE
      PRINT 217
      FORMAT (* I=BLOCK NUMBER*/* FTOT=NOISE FIGURE(DB), FIRST I BLOCKS*
217
     1 /* FRAC=PILATIVE MOISE CONTRIBUTION, BLOCK I*/
     2 * CUM=RELATIVE NOISE CONTRIBUTION, FIRST I BLOCKS*/
     3 * F(I) = NOISE FIGURE (90) LOCKING INTO BLOCK I*/
     4 * SLN=SENSITIVITY(DAM) LOOKING INTO BLOCK I(S/N=008)*////)
      IF(IFLAG.E7.0.)G0 TO 300
     INTERHOD COMPUTATION
255 K=5
      DO 265 M=1,3,2
      00 256 I=2, NR
      GP(I)=GP(I-1)*RGVD(I-1,4,2)
256
C
     PT COMPUTATION
      PT=0.
      PO 257 I=1, NR
      IF(PGVD(1,5,1).E0.99.)50 TO 257
    CONTINUE
257
C
     PSTOT FRAG TOMPHITATION
C
      00 258 I=1, HR
      RCVD(I,1,K)=GP(I)/RTVD(I,5,2)
      IF(RCVO(I,5,1).E2.99.) RCVO(I,1,K)=0.
      RCVD(I,2,K)=RCVD(I,1,K)/PT
      RCVD(I,1,K)=RCVD(I,1,K)+RCVD(I-1,1,K)
258
     CONTINUE
C
C
      SUMMATION OF FRAG
      RCVD(1,3,K)=96VD(1,2,K)
      00 259 I=2, NR
259
      RCVD([,3,K)=RCVD([-1,3,K)+RCVD([,2,K)
      I=NR-1
C
C
    COMPUTE P3(I)
      RGVD (MR, 4, K) = 1 ./ 20 VD (NR, 5, 2)
      IF(I.En. 0) 50 Th 251
      RCVD(I,4,K) =RCVD(I+1,4,K) +2CVD(I,H,2)+1./RCVD(I,5,2)
      IF (PCVO(I,5,1).E).93.1 ROV)(I,4,K)=RCVD(I+1,4,K)+RCVD(I,H,2)
      I=I-1
      GO TO 250
    "N=K-2
261
    COMPUTE O
      DO 262 I=1, NR
      DO 262 J=1,4,3
      DO 262 J=1,4,1
IF(RCVD(I, J,K) .E0.0.) RCV)(I, J, K) = 99.
     IF(RCVD(I,J,K).E0.99.)69 TO 252
RCVD(I,J,K)=10.*ALGS1)(RCVD(I,J,K))
262 COUTTION
      DO 253 I=1, NR
      RCVD(I,5,K)=RCVD(I,5,N)/3.+2./3.*RCVD(I,4,K)
IF(RCVD(I,4,K).EQ.99.)RCVD(I,5,K)=99.
263
```

```
K=K+1
  265 CONTINUE
      PRINT INTEPMOD FIGURES
         PRINT 208
         PRINT 266
        FORMATC THIRD ORDER INTERMOD PERFORMANDE 120X, * "AXIMUN GAIN"
       1 20x, *MINIMUM GAIN*//* 3LOCK *, 2 (*PSTOT FRAG CUM PS(I)*
        00 267 I=1, 11R
        PRINT 216, I, (RCVO(I, J, 5), J=1,5), (RCVO(I, K, 5), K=1, 5)
267 CONTINUE
        PRINT 259
 269 FORMAT (* I=BLOCK NUMBER*/* PATOTETHIRD DROER INTERCEPT (DBM),*
       1 *FIRST I BLOGKS*/* FRACERLATIVE INTERNOD CONTRIBUTION, BLOCK*
2 *.I*/* CUM=RELATIVE INTERNOD CONTRIBUTION, FIRST I BLOCKS*/
3 * P3(I)=INTERNO COMPANION LOOKING INTO BLOCK I*/
4* Q=THO TONE SIGNAL PROPERCIENT (PBM) LOOKING INTO BLOCK I*/
               ORDER INTERNOD LEVEL EQUALS NOISE POWER LEVEL*///)
 C
       DYNAMIC RANGE COMPUTATION
 C++++++++
 300
       IFCIDFLAG. EQ. 01GO TO 400
        K=8
        00 350 M=1,3,2
00 310 I=1,NR
        RGVD(I,1,K) = RCV3(I,4,1)
        RCVD(1,2,K)=RCVD(1,1,7)
310
        RCV0(1,3,K)=RGV0(1,1,7)
        GG=0
        00 315 I=2, MR
        GG=GG+RCVD(I-1,4,1)
        RCVD(1,3,K)=RCVD(1,2,K)-55
        IF(ROVO(I,3,K) .6T. ROVD(I-1,3,K))RCVD(I,3,K)=RCVD(I-1,3,K)
315
        CONTINUE
        RGV0(1,5,K) =RGVD(NR,3,K)
        J=NR-1
        00 320 I=2,J
        RGVD(I,5,K) =RGVD(I,1,7)
        IT=I+1
        GO 318 N=IT, NR
       GG=GG+RCVD(N-1,4,1)
      ROVO(N, 5, K) = ROVO(M, 2, K) - GS
       IF(RCVO(1,5,K) .GT. 20VD(N,5,K)) RCVD(1,5,K) = RCVD(N,5,K)
319
       CONTINUE
321
        CONTINUE
       RCVD (!!R, 5, K) = RCVD (NR, 1,7)
        RCVD(1,4,K) =RGVD(1,1,K)
        00 330 I=2,NR
130
       PCVD(I,4,K) =RCVD(I-1,4,K)+RCVD(I,1,K)
        K=K+1
359
        CONTINUE
        PRINT 208
       PRINT 360
       FORMAT (/* DYNAMIC RANGE COMPUTATION*/20x, *MAXIMUM GAIN*, 20x,
360
      1" HINIMUM GAIN" // RLOCK +, 2(" G DECOM STOT STOT D(1) +5X))
```

```
DO 370 I=1,NR
      PRINT 365, I, (RCVO(I, J, &), J=1,5), (RCVO(I, <,9), K=1,5)
      FORMAT (13,2X,2 (5F6.1,3X))
355
379
      COUTINUE
      PRINT 375
375
      FORMATI " I=BLOCK NUMBER*/* G=GAIN(DB1, BLOCK I*/* DECOM=1 DB COMP
      1ESSION POINT, PLOCK -*/* DIOT=1 DB COMPRESSION, FIRST I BLOCKS*/*
      2GTOT=TOTAL GAIN, FIRST I BLOCKS*/* D(I))1 DB COMPRESSION, LOOKING
      SINTO PLOCK I*////)
    SPUR COMPUTATION
      IF(ISFLAG. 10. 0) 60 TO 500
400
       PRINT 208
      PRINT 410
       FORMAT ( SPIR COMPUTATIONS )
410
      00 460 I=1, NR
      IF(RCVD(1,2,7).E0.0) 50 TO 450
       FS1=RCVD(I,2,7)-.001
       FS2=RCYP (I, 3,7)+.G01
       FO=RCV0(1,4,7)
       FI1=RCVD(I,5,7)-.001
       FI2=RCVD(I,6,7)+.001
       NO 455 M=1.6
       YM=M
      00 450 N=1,5
       XN=N
       FS4= (FI1+X4+F0)/YM
       FS3= (FI2+X4*F0)/X4
       FSG= (XN*FO-FI1)/XM
FSG= (XN*FO-FI2)/XM
       JSW= 0
       IF(FSA.LT.FS1.0R.FS1.6T.FS2)30 TO 420
       PRINT 411, M, N, "FSA=", FSA, I
       FORMAT(1X, "4 = ", 13, 4X, "N = ", 13, 4X, A4, F16, 2, 4X, "BLOCK= ", 13)
       JS4=1
       IF(FSB.LT.FS1.0R.FS3.GT.FS2)50 TO 430
PRINT 411,1,N,"FSB=",FS3,I
420
       JSH=1
       IF (FSC.LT.FS1.02.FSC.ST.FS2) 30 TO 440
430
       PRINT 411, M, N, "FSC=", FSC, I
       JSW=1
IF(FSO.LT.FS1.0R.FSD.GY.FS2)50 TO 445
PRINT 411,4,N,"FSO=",FSD,I
440
       GO TO 450
445 IF ((FS2-F31). GE. (FI2-FI1)) 30 TO 450
       IF(JSW. E0.1) GO TO 450
       FS4=XMFFS1-XNFFO
       FSR=XM#FS2-XN#FO
       FSC=-FSA
       #50=-F58
       IF(FSA.LE.FIZ.AND.FSA.GE.FI1) PRINT 411,4,N,"FSE=",FSA,I
       IF(FSP.LE.FI?.AND.FSB.GT.FI1) PRINT 411,4,4,"FSF=",FSD,I
IF(FSC.LE.FI2.AND.FSC.GE.FI1) PRINT 411,4,4,"FSS=",FSC,I
       IF(FSD.LE.FI2. AMD.FSD. GT. FI1) PRINT 411,4,4,"FSH=",FSD,I
450
       CONTINUE
455
       PRINT 101
```

```
460
       CONTINUE
       PRINT 465
FORMATI* M, N=DRDER OF SPURS PRODUCED IN THE IF BAND*/
     1. ESV= LEGGIE JOA VALUE ALE AND INTERCES ES EITAL SE ESB= ESE CAROLLA VALUE ALE AND INTERCES ES EISAL
      3º FSC=FREGUENCY AT WHICH NEO-MES INTERCEPTS FILE/
      4* FSD=FREDUENCY AT WHICH NFO-MFS INTERCEPTS FIRM/
5* FSE=FREDUENCY AT WHICH MFS-NFO INTERCEPTS FS1*/
      6. FSF=FREQUENCY AT WHICH MES-NEO INTERCEPTS ESS*/
      7. FSG=FREQUENCY AT WHICH NEO-MES INTERCEDTS FC1*/
      8* FSH=FREQUENCY AT WHICH NFO-MFS INTERCEPTS FS2*////)
C++
    END PROGRAM PROCESSING
C,
Canadasasa
       IF(NREC.GT.50)GO TO 8
       PRINT 501
500
       FORMATIC COMPUTATIONS COMPLETE. DO YOU WISH TO CONTINUE?",
501
      1 /* TYPE YES OR NO. 14 ?*)
       READ 105, ANS
PRINT 502
       FORMAT (* DO YOU HISH TO SAVE THIS DATA?*/* TYPE YES OR NO */* ?*)
502
       READ 105, ANS2
       IF (ANS2. ER. 1HY) WRITE (2,92) NREC, NR
       IF (ANS2. EQ. 1HY) HP ITE (2, 91) ( (RCVD(I, J, 1), J=1, 5), I=1, NR)
       IF(ANS2.EQ.1HY)WRITE(2,91)((RCVD(I,J,7),J=1,6),I=1,NR)
       IF (ANS. EO. 14Y) GO TO 505
       IF(ANS2. ED. 144) PRINT 503
FORMAT(* DATA WRITER TO TAPE2---PLEASE COPY TO PERM FILE *
      1 *DEVICE AND */* CATALOG FOR FUTURE USE*)
       STOP
       PRINT 504
505
       FORMAT (* DO YOU WISH TO REEDIT CURRENT DATA*/* TYPE YES OR NO*/
504
       1 * ?*)
       READ 105, AVS
        IF(ANS.EO. 1HY) GO TO 15
        GO TO 1
600
        STOP
        END
```